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Cerebral Complications Incurred During Pregnancy and the Puerperium

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KENNETH H. ABBOTT, M.D., Los Angeles

• In a statistical study of maternal mortality cases in Franklin County, Ohio, with a total of 170 deaths in a ten-year period (1948-1957), there were 36 fatal cases with cerebral complications of various types. Intracranial hemorrhage was the cause of death in 17 cases; subarachnoid hemorrhage in eight; intracerebral hemorrhage in eight and subdural hemorrhage in one case. There were nine cases of intracranial tumor with fatality. In a miscellaneous group of ten "cerebral deaths" infectious processes were the cause in eight cases, including tuberculous meningitis, purulent meningitis, brain abscess, acute (cerebromedullary) poliomyelitis, "viral" encephalitis, toxoplasmosis and tetanus.

In a smaller clinical (nonfatal) group with cerebral complications occurring during pregnancy and the puerperium, two patients with subarachnoid hemorrhages made spontaneous recovery. A diagnosis of intracerebral hemorrhage was made in three instances, in two of which operation was done and evacuation of

blood clots was accomplished. One patient recovered spontaneously from a minimal hemorrhage.

Five other persons had cerebral thrombosis, three in the third month of pregnancy and two in the immediate puerperium. All recovered, with some residual deficits.

Three patients with intracranial tumor were successfully treated surgically but with disappointing results ultimately (one case each of cerebellar medulloblastoma, cerebral astrocytoma and supratentorial meningioma).

Only when the obstetrician, neurologist and the neurosurgeon are fully aware of the signs, symptoms, and many times the rapid course of these cerebral complications of pregnancy, can there be any material lowering of the morbidity and mortality. Emphasis should be placed on the early investigation of all neurological complaints during pregnancy and the puerperium, with immediate institution of an aggressive diagnostic and therapeutic regimen.

CEREBRAL COMPLICATIONS occurring during pregnancy and the puerperium has been the subject of several reviews in recent years that have emphasized such conditions as puerperal hemiplegia, subarachnoid and intracerebral hemorrhage, tumor and abscess, leptomeningeal and cerebral infectious

processes, acute demyelinating diseases and other neurological disorders. From these reviews, it has been learned that all too frequently what appears to be minor symptoms and signs referable to the central nervous system are overlooked in pregnant patients or are thought of as "just expected to occur." Thus they are not given the attention they deserve until other more obvious or serious signs appear. As pointed out by Boshes and McBeath,⁵ this neglect is particularly likely in the case of minor

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cerebral infarctions that may occur during pregnancy and the puerperium. Later the infarcted area gives rise to seizure activity and only then is the true nature of the original episode recognized. The serious significance of meningeal symptoms consequent to subarachnoid hemorrhage has been emphasized by Cannell and Botterell⁶ and others.* This and other catastrophic intracranial lesions occurring during pregnancy and the puerperium are a challenge to neurosurgeons who ponder a reduction in the mortality and morbidity of these and other cerebral lesions. It seems worth while, therefore, to present a brief statistical analysis of fatal cases as well as a few examples of nonfatal cerebral complications personally observed.

MATERIAL

Obstetricians in Franklin County, Ohio, have a most active and discerning Maternal Mortality Study Committee which carefully reviews all cases of maternal deaths including those in which the patient died within the postpartum year. Through the courtesy and cooperation of this committee, the authors have been privileged to review and report here all deaths from 1948 through 1957 in which there were neurological complications or neurological conditions associated with pregnancy and the puerperium. In this ten-year period there were 157,654 live births and 170 maternal deaths; 36 of the maternal deaths (23 per cent) were of interest in this study (Table 1). So far as is known, there are no accurate statistics indicating the frequency of cerebral complications of nonfatal obstetrical cases. The authors, therefore, reviewed the records of all women 15 to 50 years of age in the University Hospital, Ohio State University, noting the occurrence of cerebrovascular accidents of all types and of intracranial tumors over the past ten-year period. To these have been added nonfatal clinical cases of cerebral complications of pregnancy taken from the personal files of one of us (not University Hospital cases). A total of 14 nonfatal cases was found that occurred during pregnancy and the puerperium (six months). It was soon apparent that not all cases with minor cerebral complications had been indexed and that those cases of cerebral vascular accidents occurring in the puerperium were not well cross-indexed. There will be presented, therefore, only a few examples of subarachnoid hemorrhage, puerperal hemiplegia, and intracranial tumors to emphasize the importance of thinking of these conditions when any neurological sign or symptom appears in pregnancy and the puerperium.

For this study, the records of the Franklin County Maternal Mortality Study Committee were used, tak-

TABLE 1.—Franklin County (Ohio) Maternal Mortality Study—10 Years, 1948-1957

Total live births	157,654
Total deaths	170
Deaths due to central nervous system lesions.....	36

TABLE 2.—Franklin County (Ohio) Maternal Mortality Study—10 Years, 1948-1957

Intracranial causes of death:	
Intracranial tumors	9
Intracerebral hemorrhage	8
Subarachnoid hemorrhage	8
Viral or bacterial disease	8
Miscellany	3

ing all cases in which death occurred during pregnancy or within a six-month postpartum period. These cases were divided into the following groups: Subarachnoid hemorrhage, subdural hemorrhage, intracerebral hemorrhage, intracranial tumors, and a miscellaneous group of infectious processes, head injury, etc. (Table 2).

Subarachnoid Hemorrhage

There were eight persons who died of subarachnoid hemorrhage during or shortly after pregnancy in this ten-year period from 1948 to 1957 inclusive (Table 3). The ages ranged from 22 to 42 (three each in the 20's and 30's and two in the 40's—41 and 42 years old respectively). Six of these persons had delivery at term; in one of the two the hemorrhage occurred at the eighth week and in the other in the thirty-second week of gestation. As to the six with delivery at term, one apparently had severe bleeding before going into labor and was soon comatose. Delivery was carried out with the patient in a respirator and she died two days later. In two other cases bleeding occurred about three hours postpartum, and in one each it had taken place on the third, sixth, and thirtieth postpartum day. Twins were born to one patient whose symptoms appeared about three hours postpartum. Six of these patients had had one or more previous pregnancies with a maximum of five. In the last instance there had been one abortion and four term pregnancies without previous signs of intracranial bleeding. None of these persons lived over six days after the clinical onset of subarachnoid hemorrhage. In four of the eight fatal cases death occurred within 24 hours; one patient was dead on arrival at the hospital, having lived only "a few minutes," and two each lived three days and six days respectively.

It is of some interest that one (without previous pregnancies) had had an acute subarachnoid hemorrhage 18 months before, and bilateral carotid angiography and ventriculography at that time showed no abnormalities. Unfortunately the vertebral-basilar arterial system had not been visualized

*References 8, 9, 11-18, 20-22, 24-26, 28, 29.

TABLE 3.—Subarachnoid Hemorrhage, Franklin County (Ohio) Maternal Mortality Study—1948-1957 Inclusive

Case	Age	Previous Pregnancies	Onset: Stage of Pregnancy	Period of Survival	Delivered	Previous S.A.H.	Diagnosis	Comments
1	22	0	8 weeks	6 days	No	0	S.A.H.	Negative angio. and ventric. No autopsy.
2	31	3	Term and 3 P.P.D.	1 day	Yes	0	S.A.H.	L.P., no other tests. No autopsy.
3	32	4	Term and a few hours	6 days	Yes. Twins	0	S.A.H., carotid aneurysm	L.P., angio., cranio. Clipped aneurysm. Autopsy.
4	27	0	Term—3 days	3 days ante- and 1 P.P.D.	Yes after S.A.H.	18 mo. previous	S.A.H.	L.P. negative angio. 18 mos. previous. Autopsy.
5	42	5	32 weeks	5 hours	Cesarean section	0	S.A.H.	L.P. only
6	32	2	Term and 3 hours	3 days	Yes	0	S.A.H.	L.P. only
7	41	1	Term and 1 day	1 day	Yes. 1 day S.A.H. in respirator	0	S.A.H.	L.P. only
8	24	5 (1 abortion, 4 term)	Term and 30 days	Few hours		0	S.A.H. aneurysm R.I.C.	Dead on arrival at hospital. Autopsy.

Abbreviations:
S.A.H. = Subarachnoid hemorrhage
L.P. = Lumbar puncture

R.I.C. = Right internal carotid
Angio. = Angiography
Ventric. = Ventriculography

Cranio. = Craniotomy
P.P.D. = Postpartum days

TABLE 4.—Intracerebral Hemorrhage, Franklin County (Ohio) Maternal Mortality Study

Case	Age	Onset		Lived	Operation	Autopsy	Location of Hemorrhage
		Gestation	Postpartum				
9	29	Term	Undelivered	14 days	.....	Yes	Intracerebral*
10	32	Term	Undelivered	18 hours	.....	Yes	Intracerebral†
11	20	6 months	Undelivered	12 hours	Yes	Yes	Intracranial, right frontal lobe‡
12	40	Term	1 day	14 days	Yes	Yes	Intracerebral, right frontal lobe
13	34	Term	.....	.....	.....	Yes	Intrapontine and slight subarachnoid
14	40	Term	2 hours	14 hours	.....	Yes	Intrapontine
15	22	4-5 months	Undelivered	8 hours	.....	Yes	Intrapontine
36	36	7 days postpartum	7 days postpartum	13 hours	Yes	Yes	Right parietotemporal

*Eclampsia.

†Pre-eclampsia.

‡Also, necrosis of hypophysis.

nor had an interval angiographic study been performed when arterial spasm might have been absent and permitted a more accurate vascular survey.

The patient who died on the sixth posthemorrhage day was found to have a single aneurysm which was visualized angiographically and clipped intracranially. It may be that in that case the interval from the onset of the hemorrhage at 11 hours postpartum to the third postpartum day when angiography was performed was too long, although usually not considered to be so. This incident occurred before hypothermia was being used in Franklin County Hospitals.

The symptoms and signs of subarachnoid hem-

orrhage in the present series in no way deviated from those observed in other patients—headache and head pains, nausea, vomiting, stiffness of the neck, hemiplegia (in three cases) and bloody cerebrospinal fluid disclosed by lumbar puncture. It is unfortunate that more of the patients were not studied both by angiography and autopsy. In the absence of either diagnostic measure it may be presumed that in all cases the subarachnoid hemorrhages were due to rupture of an intracranial aneurysm in the circle of Willis or its immediate branches. Of course, this conclusion may or may not be correct in view of the known bleeding tendencies during pregnancy. If this assumption is true, however, it would appear

TABLE 5.—Intracranial Tumors, Franklin County (Ohio) Maternal Mortality Study—10 Years, 1948-1957

Case	Age	Onset	Diagnosis	Course and Procedures
17	23	1 hour postpartum	Parietal cystic glioma	One general seizure with rapid progression (2 hours) to coma and death
18	15	7½ months pregnancy	Intraventricular glioblastoma	H.A. progressed P.P., cranio. 15th P.P.D., death 15th P.O.D.
19	21	3 weeks postpartum	Parietal cystic astrocytoma	H.A., N. and V., L.P. and N.E. negative 5 days P.P., 19 days P.P. general seizures and apnea—death 24 hours later.
33	17	1 month of pregnancy	Temporal astrocytoma grade IV	N. and V. 1st month, right hemiparesis 1 month prepartum, hemiplegia by 3 weeks P.P., P.E.G. and cranio. Death 1 day postoperative.
34	28	1st month of pregnancy	Temporal astrocytoma grade II	Pre-eclampsia, dead fetus with induced labor. H.A. 2 weeks, cranio. with multiple re-exploration for wound infection.
16	29	5½ months postpartum	Occipital meningioma	Blurred vision 2 days then marked lethargy, aspiration, pneumonia with immediate death.
20	28	6 weeks postpartum	Malignant meningioma temporal lobe with massive hemorrhage	Sudden H.A. followed quickly by coma; cranio. done, death in 24 hours.
21	22	32 weeks pregnancy	Malignant ependymoma fourth ventricle	H.A., blurred vision and vertigo, diagnosis made, cesarean section and 12 days later cranio. Death 36 hours postoperative.
35	23	Immediate postpartum	Malignant fourth ventricle papilloma	1947 "burr holes" for pseudo tumor, P.P. H.A., blurred vision, diplopia, 50 days P.P. cranio. and venticisternal shunt. Death 107 days P.P.

Abbreviations:

H.A. = Headache

N. and V. = Nausea and vomiting

L.P. = Lumbar puncture

P.E.G. = Pneumoencephalogram

N.E. = Neurological examination

P.O.D. = Postoperative day

P.P.D. = Postpartum day

P.P. = Postpartum

Cranio. = Craniotomy

that subarachnoid hemorrhage in the obstetrical period is peculiarly lethal.

Intracerebral Hemorrhage

Data regarding the eight fatal cases of cerebral hemorrhage are shown in Table 4. It will be noted that there were three patients each in the third and fourth decades of life and two in the fifth (each 40 years old). In three instances of intracerebral hemorrhage, eclampsia or preeclampsia were associated factors; in one of these there was necrosis of the hypophysis. Operative drainage of intracortical blood clots was accomplished in the two noneclamptic cases, and in one eclamptic case. It seems doubtful that anything could have been done surgically for the three patients with intrapontine (brain stem) hemorrhages.

The symptoms in this group were headache, convulsion, hemiplegia and coma—as well as the preexisting and apparently causative arterial hypertension in both the eclamptic and noneclamptic cases. The course of illness was cataclysmic, being rapidly fatal except in two cases with a survival of 14 days each.

The precise cause of the intracerebral hemorrhage was not always ascertained, although in one instance a small vascular malformation was observed at the margin of a massive hemorrhage into a frontal lobe. In a review of this problem, Christensen⁷ concluded that massive intracerebral hemorrhage

occurs only consequent to alterations of vascular walls—a condition which may exist during pregnancy and the puerperium. She also pointed out that such hemorrhages (subarachnoid, intracerebral, intraventricular) frequently arise in intracerebral and intramedullary vascular malformations.

Subdural Hematoma

Subdural bleeding occurred in only one instance, in that of a nurse who in the immediate puerperium had thrombophlebitis in one lower extremity and was treated with anticoagulants (heparin and bis-hydroxycoumarin). She was very ill and had shown signs of probable pulmonary embolism for which anticoagulants seemed justifiable. Nevertheless, subdural bleeding developed and was not recognized until the patient became comatose. The pupils of her eyes soon became dilated and fixed and respiratory failure followed. Neurosurgical intervention was obviously then too late.

Intracranial Neoplasms

Intracranial tumors were the cause of death in nine instances (Table 5).^{*} There were three examples of astrocytoma (two cystic), two of glioblastoma multiforme (astrocytoma Grade IV), two of meningioma (one malignant), and one each of ep-

^{*}In addition to these the authors have personal records of two more fatal cases, one of astroblastoma and the other of a low grade astrocytoma.

TABLE 6.—Viral and Bacterial Disease, Franklin County (Ohio) Maternal Mortality Study

Case	Age	Onset	Diagnosis	Survival
22	16	24 weeks pregnant	Tuberculous meningitis	1 month
22a	27	4½ months pregnant	Tuberculous meningitis	12 days
24	29	5 days postpartum	Tetanus	7 days
26	38	31 weeks pregnant	Septicemia and meningitis	2 days
27	27	7 months pregnant	Cerebellar abscess from otitis media	15 days
28	37	17 days postpartum	Poliomyelitis	30 days
29	25	Term	Toxoplasmosis	41 days
30	20	26 weeks pregnant	Viral encephalitis	1 week

endymoma and malignant papilloma (both in the fourth ventricle). Two occurred in the second decades (ages 15 and 17) and seven in the third decade (21 to 29 years).

In four cases the symptoms were few and practically unnoticed during pregnancy, but once they appeared death soon followed. One of the patients died of aspirating vomitus the second day after the onset of headache and lethargy. This occurred five and a half months after a normal term pregnancy and delivery. Another patient went through pregnancy without a symptom, save for a few headaches, then three and a half weeks after delivery suddenly had headache and vomiting. The results of neurological examination and of lumbar puncture and cerebrospinal fluid examination were reported as negative. A convulsion occurred five days later followed by apnea and death in 24 hours. At autopsy a parietal cystic astrocytoma with midbrain hemorrhage was found. In another case in the sixth week postpartum a malignant meningioma, which had remained silent until then, provoked a massive intracerebral hemorrhage which rapidly brought on headache and coma. Death followed in spite of prompt neurosurgical intervention. One patient had a generalized seizure one hour postpartum and died two hours later without any known previous symptoms. In five patients of this group, the onset of symptoms, of increased intracranial pressure or catastrophic manifestations occurred postpartum, one each, "immediately," one hour, three weeks, six weeks and five and a half months after parturition. In four cases symptoms occurred during pregnancy (one patient was delivered at seven and a half months) causing spontaneous delivery in one and surgical termination (cesarean section at 32 weeks) in another. In one, headaches, nausea and vomiting began after four weeks of gestation but the pregnancy went to term with spontaneous delivery. Operation was performed three weeks postpartum when she was hemiplegic and comatose and she died on the day of operation. Headaches were attributed to preeclampsia in one

TABLE 7.—Miscellaneous Neurological Causes of Death, Franklin County (Ohio) Maternal Mortality Study

Case	Age	Onset	Diagnosis	Survival
25	39	3 months pregnant	Cerebral contusion	16 days
31	19	2 months pregnant	Guillain-Barré	11 days
32	25	38 days postpartum	Subdural hematoma	

patient (Case 34, Table 5) and a dead fetus was removed by induced labor. Two weeks later a temporal lobe astrocytoma was resected. Death followed several months later from infection.

Miscellaneous Group—Viral and Bacterial Infections

A group of women died each of diverse causes; data on them is summarized in Tables 6 and 7. These causes of death included infections (tuberculous meningitis, bacterial septicemia with meningitis, tetanus, cerebellar abscess, acute anterior poliomyelitis, toxoplasmosis, viral encephalitis), Guillain-Barré syndrome, anoxia (cardiac arrest) and trauma.

Nonfatal Cerebral Complications of Pregnancy And the Puerperium

Although many examples of neurological conditions present during pregnancy and the puerperium were studied, particular note was paid to only those who had apparent cerebral thrombosis, intracranial hemorrhages (subarachnoid, subdural and intracerebral bleeding) and intracranial tumors, since these conditions might lend themselves, in this present day, to some kind of definitive therapy. Pertinent data are given in Tables 8 to 11. It will be noted that there were not as many subarachnoid hemorrhages, intracerebral hemorrhages and tumors as in the fatal cases, which may be due to such factors as inadequate cross-indexing of records, the sometimes obscure nature of lesions and the tardiness in recognition of the symptoms. It should be emphasized that whereas cerebral thrombosis was not noted in the group of fatal cases, it occurred in four cases in the group of patients recovered (Table

TABLE 8.—Subarachnoid Hemorrhage—Nonfatal Cases

Case	Age	Previous Pregnancies	Onset: Stage of Pregnancy	Delivered	Previous Subarachnoid Hemorrhage	Diagnosis	Comments
1	38	0	8 hours postpartum	Yes	None	Subarachnoid hemorrhage	Complete angiogram negative; complete recovery
2	22	0	With labor	Yes	None	Subarachnoid hemorrhage and postcerebral thrombosis	Complete recovery

TABLE 9.—Intracerebral Hemorrhage—Nonfatal Cases of Cerebral Complications of Pregnancy

Case	Age	Onset	Previous Episodes	Complications	Diagnosis	Operations	Results
1	33	10 days P.P.	None	None	I.C.H. spontaneous	Angio., cranio., V.J. shunt	Hydroceph. blind
2	27	5 days P.P.	None	None	I.C.H. spontaneous	None	Recovery
3	27	With labor	None	None	A.-V. malformation	Angio., cranio.	Minimal hemiparesis

Abbreviations:
I.C.H. = Intracranial hemorrhage
Angio. = Angiography
Cranio. = Craniotomy
V.J. = Ventriculojugular
A.V. = Arteriovenous
P.P. = Postpartum

TABLE 10.—Miscellaneous Nonfatal Cases of Cerebral Complications of Pregnancy

Case	Age	Onset	Previous Episodes	Complications	Diagnosis	Operations	Results
1	27	3 months pregnant	None	None	Cerebral thrombosis	None	Hemiparesis
2	30	3-4 hours postpartum	None	Pre-eclampsia	C.V.A. hemorrhage	None	Hemiparesis
3	27	3 months pregnant	None	None	Thrombosis internal carotid	Angiography	Mild hemiparesis
4	21	3 months pregnant	None	None	Thrombosis middle cerebral artery	Angio. and sup. cer. S. ganglionectomy	Mild hemiparesis
5	39	6 days postpartum	None	None	Cerebral thrombosis	Angiography	Mild hemiparesis
6	29	5½ months pregnant	None	None	Trauma, skull fracture, subdural hematoma	Craniotomy	Personality changes, slight aphasia, hemiparesis

Abbreviations:
Angio. = Angiography
Sup. Cer. S. = Superior cervical sympathetic
C.V.A. = Cerebral vascular accident

10). This suggests, therefore, the need of adequate neurological investigation of all untoward symptoms during pregnancy and the puerperium referable to the brain, including ophthalmoscopic, x-ray and electroencephalographic examinations, and, when indicated, examination of the cerebrospinal fluid, and in some cases angiography and air studies. Only when these investigations are promptly carried out can one expect to arrive at early diagnosis and appropriate therapy, and thus reduce the mortality or improve the results in the nonfatal cases.

GENERAL CONSIDERATIONS

It would appear from this study and that of Cannell and Botterell⁶ that subarachnoid hemorrhage is an extreme emergency and needs immediate neurosurgical attention. With the routine use of hypotension and hypothermia and possibly newer methods to come, it may be that it will be found that earlier

surgical intervention will reduce the mortality in this group.

Earlier diagnosis and surgical removal of intracerebral blood clots are of equal importance, and it is believed that this will eventually produce much brighter results than those recorded here.

Cerebral thrombosis is a condition which occurs all too frequently during pregnancy. This problem has been emphasized by Martin,^{19a} Martin and Sheehan,^{19b} Symonds,²⁷ Boshes and McBeath,⁵ Alpers and Palmer¹ and many others. It appears that not in all instances is this lesion due to primary arterial thrombosis. It may well represent (a) thrombosis of venous sinuses, or even (b) a retrograde embolism from the pelvic veins via the paravertebral veins of Batson³ (Martin^{19a}). This brings to light the problem of vascular wall and blood clotting changes that occur during pregnancy and the puerperium and may have a direct bearing on obstetric and puerperal thrombosis. Infection as a cause of

TABLE 11.—Intracranial Tumors—Nonfatal Cases

Case	Age	Onset	Diagnosis	Course and Procedure	Results
1	27	Labor	Cerebellar medulloblastoma	Headache and diplopia, after delivery ventriculography, subtotal excision	Poor course, downhill
2	20	4 months pregnant	Cerebellar astrocytoma grade II	Headache, lightheadedness, diplopia, vertigo, ataxia, ventriculography, craniotomy, ventriculocisternal shunt	Poor course, downhill
3	24	6 years intermittent	Sphenoidal ridge meningioma	Headache, blurred vision, no operation	No increase in symptoms, severity or frequency

cerebral venous thrombosis is not to be overlooked.

The danger in the use of anticoagulants for thrombophlebitis is well illustrated by the case in this series in which the use of bishydroxycoumarin resulted in spontaneous subdural hemorrhage that was unrecognized until coma occurred. Only then was the patient referred for neurosurgical care, too late to prevent a fatal issue. Earlier recognition of the neurological signs of clouding of the sensorium, mild hemiparesis and early papillary changes might have prevented death.

In patients with intracranial tumor a somewhat different problem is presented. Most investigators believe that the brain becomes edematous or in some way increased in volume during or immediately after pregnancy. This apparently is associated more with meningiomas^{2,30} and acoustic neurofibromas⁴ than with tumors of glial origin.^{10,22,23,25} Angiomas become engorged and are subject to thrombosis and hemorrhage. If hemorrhage occurs in or around such a tumor, the symptoms may prove to be catastrophic, as in the case of a meningioma in the "fatal" series here reported. Otherwise, the onset of symptoms may appear more gradually, requiring close and accurate observation. When recognized, appropriate neurosurgical attention must follow in this group of cases. It is now also appreciated by most neurosurgeons that patients with tumors soon develop more cerebral edema and other complications than do the nonpregnant or nonpuerperal patients. This suggests the need for further studies on cerebral edema, cerebrovascular states and electrolytic balance in the obstetrical and puerperal periods.

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NOTE: An extensive review of the literature which was a part of this presentation when it was read, has been omitted from this published version.

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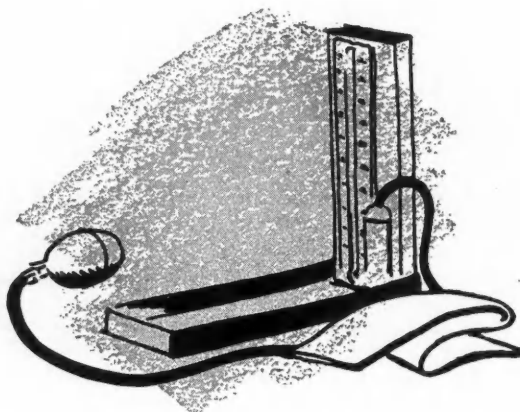
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Paget's Disease

Changes Occurring Following Treatment with Newer Hormonal Agents

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IT HAS BEEN ESTIMATED that roughly 3 to 4 per cent of the population over the age of 40 years has Paget's disease. A recent study by Pygott⁸ of the radiologically observable incidence of this disease among some 70,000 patients examined was 3.5 per cent for both sexes over the age of 45 years, which agrees quite well with previous studies at necropsy. It appears that the incidence in men alters little from 35 to 54 years, but thereafter increases rapidly up to the age of 75; in women, by contrast, the initial incidence up to 55 years is quite similar to that of men, but the increase after 55 is not as pronounced as in men. This makes Paget's disease among the most common of nonmetabolic bone diseases. Its cause is as yet unknown. Some investigators have suggested the possibility of a primary defect in blood vessels going to bone, while others believe that the increased vascularity is a secondary effect.¹⁴ Still others, such as McKusick,⁷ have proposed a general wearing out, or "abiotrophy" of connective tissue of bone as primary cause. McKusick also cited the evidence for the known familial tendency for this disease as a genetically determined predisposing factor. In any case, it has become generally accepted, as so well described by Reifenstein and Albright,¹² that the primary event in this disorder is an accelerated, localized breakdown of bone. Areas of greatest wear and tear, such as the spine, pelvis, femur and skull, seem to have the highest degree of involvement. Depending on the healing potential, there will be repair of bone in a rather irregular fashion. In a small number of patients, decided overgrowth with deformity, bowing and fractures occur. At times pressure on vital structures, such as nerves, may produce deafness or intractable pain. If a great deal of the skeleton is involved, a greatly expanded circulatory bed through bone is produced, equivalent to multiple fistulae, and a state of high output heart failure may ensue.^{9,14} In a small number of cases, sarcomatous changes take place. In Pygott's series⁸ this complication was present in only 3 of 689 cases.

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■ From experience in six cases the anabolic steroid hormones, especially long-acting testosterone and estrogen preparations, are the treatment of choice in Paget's disease, as in postmenopausal osteoporosis. Details of the management of three patients over a period of four years are presented.

Roughly 4 per cent of the population, mostly persons over 40, show some evidence of Paget's disease. Only a small number of them, however, have severe manifestations requiring treatment, such as pain, bowing or fracture of the bones, pressure on nerves or heart failure. In rare cases malignant changes occur in the involved bone.

Since the cause of Paget's disease is not known, treatment in the past has been largely empirical. Reifenstein and Albright had advocated the therapeutic use of calcium, vitamin D and ascorbic acid, and, in postmenopausal women, administration of estrogens; but with fractures or immobilization, intake of calcium-containing foods, such as milk, must be restricted to avoid dangerous piling up of calcium and kidney stones, and fluids must be forced. In recent years anabolic steroid hormones, principally oral androgens and estrogens, have been employed by Gordan and others to promote bone repair, lessen bone pain and decrease urinary excretion of calcium. While these hormones probably do not arrest the disease, they seem to stabilize it and bring relief of symptoms.

More recently, Albright and Henneman demonstrated that very large doses of corticotropin (ACTH) or cortisone resulted in immediate cessation of bone pain, decrease in urinary excretion of calcium and histologic evidence of regression of the disease process. The large doses required, however, also produce dangerous side effects, such as psychosis and osteoporosis, indicating that such treatment probably should not be continued over long periods.

Since the cause of Paget's disease is unknown, treatment in the past has been largely empirical, including the use of vitamin C, vitamin D and calcium. Since many features of the initial phase of Paget's disease are similar to those of acute osteoporosis, the use of estrogen in a manner quite similar to that employed in the treatment of postmenopausal osteoporosis had been suggested by Albright and Reifenstein. This seemed to lessen the hypercalciuria and promote bone repair. In men, androgens as well as estrogens were used by Albright, as well as by others, such as Gordan³ who

observed that this treatment would lessen hypercalciuria, diminish bone pain and aid bone repair. More recently, Albright and Henneman¹ made the interesting observation that large doses of corticotropin (ACTH) and cortisone, contrary to expectation, would not increase or enhance the catabolic phase of Paget's disease but would actually lessen the hypercalciuria of bone catabolism, decrease the vascularity of bone and lessen bone pain. A decrease in the high cardiac output was observed in a series of patients so treated by Rapaport and co-workers.⁹ This observation raises some important points as to the etiology of Paget's disease, which may represent an inflammatory or collagen-like disorder of bone. Unfortunately, however, the large doses needed to effect remission of the process would also produce undesirable side effects, such as psychosis and acute osteoporosis of the normal portion of the skeleton, so that prolonged treatment is not feasible.

The anabolic steroids, especially the more recently introduced long-acting combinations of androgens and estrogens, remain, then, in the author's experience, the most effective and practical agents in the treatment of this disease. Results of such treatment in terms of clinical improvement, chemical change and roentgenographically observable change are detailed below. The implications of some of these findings with regard to calcium needs of the adult skeleton, to the dangers of hypercalcemia, hypercalciuria and renal stone formation, and to the prevention of these hazards, are likewise discussed.

PATHOLOGIC PHYSIOLOGY

Reifenstein and Albright¹² well defined the sequence of events in Paget's disease. They also demonstrated possible ways of following the progress of the disease. It is possible to follow cycles of activity by comparing periodic x-ray films of the bones to determine whether there is decreased or increased density. One might also determine activity clinically by increased vascularity on palpation (increased warmth) or by auscultation, by the development of bone pain, or bowing or fracture. One can also gauge bone breakdown and repair on the basis of chemical changes in the blood and urine. Thus, increased bone breakdown due to whatever cause, possibly increased osteoclastic activity, will be associated with hypercalciuria, while bone repair or the increased activity of osteoblasts is reflected in increasing serum alkaline phosphatase. These indices seem to correlate quite well with clinical findings and with the x-ray appearance. A localized area of bone destruction may remain present for a long time,¹³ may show radiolucency on x-ray and be accompanied by hypercalciuria during the active phase and little if any elevation of the alkaline phosphatase. With active bone repair, hypercalciuria

lessens, bone density increases and the alkaline phosphatase level rises until healing is complete and a more stable state reestablished. A very high level of alkaline phosphatase is indicative of sarcomatous change. Response to treatment, likewise, can be equated in these terms, healing being signified by rise of alkaline phosphatase with decreasing urinary calcium excretion. In some instances, biopsy of specimens of bone taken serially from accessible regions, such as the skull, have well correlated with x-ray and with chemical findings.

EFFECTS OF FRACTURE AND IMMOBILIZATION

The skeleton depends for its integrity on the stresses and strains of activity. This has been well documented by the studies of Deitrick, Whedon and Shorr in immobilized normal men.^{2,18} With immobilization bone breakdown continues unabated, while the processes of bone repair are halted.

What is true for normal men is even of greater importance in patients with Paget's disease because of increased bone catabolism. If such a patient is immobilized (after a fracture, for example) the accelerated bone breakdown continues, enhanced by the catabolic effect of the stress of the fracture, resulting in overloading of the circulation and renal excretory capacity for calcium. This may give rise to significant hypercalciuria, and, if fluids are not forced, and if calcium intake is not drastically restricted, kidney stones, renal calcification and finally hypercalcemia and "chemical death" may ensue.¹² Since Paget's disease commonly affects people after the age of 45, when the steroidal balance shows a greater tendency to catabolism and lessened anabolism¹¹ especially in postmenopausal women, immobilization becomes an even greater hazard. Similar problems are encountered in elderly, bed-ridden patients, in paraplegics, in patients with osteolytic malignant disease and in arthritic patients receiving cortisone, who are all subject to complications similar to those of patients who have Paget's disease. Aside from all efforts to force fluids and to reestablish mobility, the use of anabolic steroids such as the androgens and estrogens seems to be the method of choice to hasten bone repair by enhancing nitrogen and calcium retention and thus lessening the loss of these elements in the urine. Milk and its products, our most important dietary source of calcium, must be restricted until such time as a lessening of the hypercalciuria and an increase of the serum alkaline phosphatase level indicate the skeleton again can use calcium.

In general, fractures heal quite well in patients with Paget's disease, although osteoporosis may occur at sites away from the fracture.¹² On the other hand, one often observes so-called fractures, without

displacement (Figures 1 and 2) which remain virtually unchanged in appearance for prolonged periods. The roentgenograms may be those of "pseudofractures,"—perhaps blood vessel shadows, similar to the pseudofractures in osteomalacia with milkman's syndrome.¹⁵ Patients should not be unnecessarily immobilized because of these shadows, which often remain even in well healed areas of Paget's disease.

EFFECTS AND USE OF HORMONAL AGENTS

In males, the benefits from estrogen therapy of Paget's disease as recommended by Reifenstein and Albright¹² are partially offset by the undesirable effects of such therapy, such as breast tenderness and possible testicular damage. Gordan,³ among others, extended anabolic therapy by using sublingual methyltestosterone, in both men and women with Paget's disease, observing lessening bone pain as well as lessening of the hypercalciuria frequently observed in patients with active disease. In the present series of patients with Paget's disease in the active phase, hypercalciuria was the rule, and therefore initially reliance was put on the anabolic agents alone; vitamin D and calcium supplements were not used and milk was proscribed. This provided a means of observing the effects of treatment, or of progress of the disease, and at the same time avoided significant hypercalciuria and its inherent dangers. For good measure, ascorbic acid in doses of 500 to 1,000 mg. a day were given to improve the bone matrix. Combinations of androgens and estrogens were administered in a manner quite similar to that used in the treatment of osteoporosis in postmenopausal women.^{5,6,17} In some cases in which there was clinical progress of a lesion while the patient was receiving small amounts of estrogens, both symptomatic improvement and reduction of hypercalciuria were obtained by increasing the daily dose, for example, from 1.25 to 3.5 mg. of Premarin,[®] or 1 to 3 mg. of stilbestrol, and the addition of methyltestosterone sublingually, or of Depo-Testosterone[®] 50 to 100 mg. parenterally every three to four weeks. In long term studies of three male subjects, long-acting testosterone (Delatestryl[®]) alone was used in two cases and a combination of long-acting testosterone and estrogen (Deladumone[®]) in the third. During treatment, serial determinations were made of the urine and blood calcium, phosphorus and alkaline phosphatase levels as well as clinical and x-ray observations to correlate with these changes. In the use of these hormones over four years, the effectiveness, potency and the freedom from undesirable side effects were impressive. By cyclic administration—that is, single injections every three to six weeks—treatment is greatly simplified.^{6,11}



Figure 1 (Case 1).—Paget's disease of left tibia. Serial x-ray films to show progression of lesion (marked in with dotted lines). The numbers I, II and III correspond to Chart 1, showing the dates the films were taken. Note the fissures in the upper third of the tibia in all films in virtually the same location.

Cortisone was used in only one case, that of a patient with intense bone pain and progression of disease. It had to be discontinued because of the appearance of indigestion. The observations of Albright and Henneman¹ with these antianabolic agents are of greatest interest, for they seem to indicate that these agents, although not promoting bone repair, do tend to stop bone breakdown and thus cause lessening of hypercalciuria. These observers contrasted the effect of these agents with bedrest, which, as noted above, stops osteoblastic activity while bone breakdown continues unabated. Although the use of these agents—large amounts are required—is not as yet practical, there is the definite suggestion that, in contrast to the anabolic steroids which promote healing and slow down the progress of disease but do not stop it, the antianabolic agents may bring about actual cessation of the disease stimulus. The possibility of combining cortisone with anabolic agents has not, as yet, been explored. The rationale of using such combinations has been recently discussed by Reifenstein.¹⁰

REPORTS OF THREE CASES

CASE 1. The patient, a carpenter 54 years of age in 1952, had localized Paget's disease process in the left tibia (Figure 1, I). Except for some increased warmth, there was no complaint. The blood and urine chemical values were normal except for a

VITAMIN C 500 MG./DAY

DELADUMONE CC.I.M. [↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓]

DELAESTRYL CC.I.M. [↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓]

X-RAYS

	I	II	III	
SERUM CALCIUM MG. %	9.0	9.9	8.5	9.6
ALKALINE PHOSPHATASE B.U.	~7	~8	~6	~7

**URINARY CALCIUM
MG./24 HRS.**

NORMAL LIMITS

slightly elevated alkaline phosphatase level (Chart 1). No treatment was given until 1955 when the patient returned with complaint of a great deal of pain over the shin, and some bowing. While the blood chemical values were virtually the same as in 1952, there now was intense hypercalciuria—a 4 plus reaction to a urinary Sulkowitch test and urinary calcium levels of 250 to 350 mg. per 24 hours on a diet free of milk and cheese. X-ray films (Figure 1, II) showed progression of the disease process, as well as demineralization of the tibia, with several fissure fractures in the upper third. Treatment consisted of a high protein diet, free of milk and cheese, the administration of ascorbic acid, 500 mg. daily, and long-acting anabolic hormones in the form of Delatestryl®* and Deladumone®† given in doses of 1 to 3 cc. intramuscularly every three weeks. From an inspection of Chart 1 it appears that the combined androgen-estrogen period was more effective in reducing hypercalciuria, although this is not conclusive. The patient experienced fairly prompt relief of bone pain; the hypercalciuria gradually lessened

The patient stopped hormonal treatment for reasons of his own in November 1958. He was fully active, and in May, 1959, while bowling, he slipped and fractured the tibia at the site of one of the fissures. Intense hypercalciuria with demineralization was again noted, and hormonal therapy was

†Each cc. contains 90 mg. of Delatestryl and 4 mg. of Delestrogen.

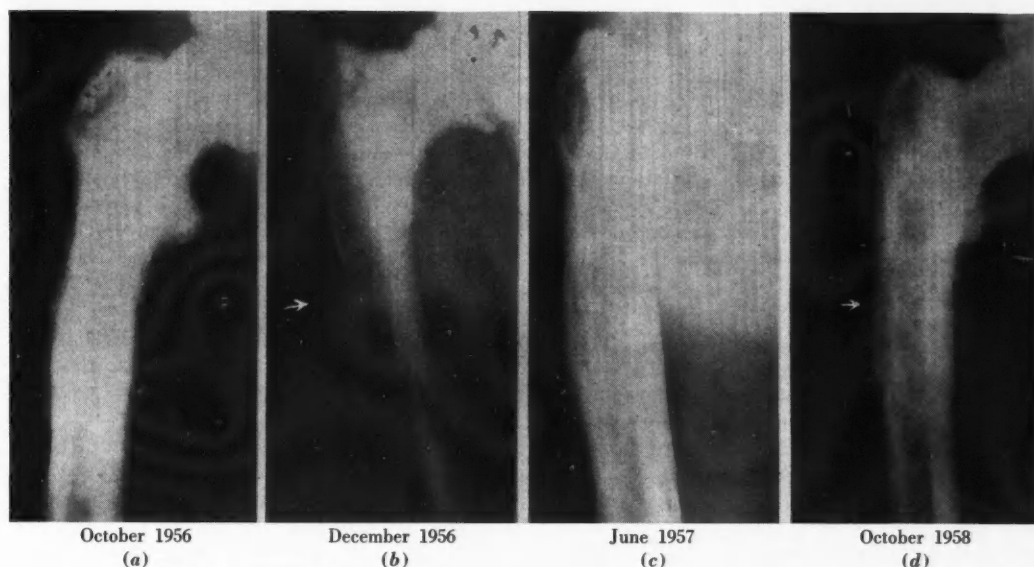


Figure 2.—Serial x-ray films showing progression and healing of lesion. Note that the fissure fractures observed in 1956 (arrow) remained stationary. The area of rarefaction along the lateral margin of the femur is marked in for better visualization.

resumed. The fracture healed well with minimal immobilization.

CASE 2.* A 54-year-old laborer was first noted to have Paget's disease of the pelvis in 1951. In the absence of symptoms or chemical abnormalities except for a slightly elevated alkaline phosphatase, no treatment was given. In February 1956, a minor injury caused a fracture through a pubic ramus. X-ray films at this time showed decided progression of the disease process, with many areas of radiolucency. The alkaline phosphatase level was 13.8 Bodansky units, and the urinary calcium excretion 211 mg. per 24 hours on a diet without milk or cheese. The patient complained of a feeling of warmth and painful congestion about the left hemipelvis. Treatment was begun with a high protein diet, additional ascorbic acid, and anabolic steroid hormones, first Depo-Testosterone® and subsequently Delatestryl®, in doses of 150 to 300 mg. every three weeks. There was rapid abatement of symptoms and lessening of hypercalciuria; after a rise of the alkaline phosphatase level to 16.2 Bodansky units it gradually fell to 10.9 units over seven months of continuous treatment. The patient was fully ambulatory after a short initial period of immobilization. X-ray films in January 1957 showed remineralization of the previously observed radiolucent areas in the pelvis. Treatment was maintained at 2 cc. Delatestryl (400 mg.) every four to six weeks. The patient made no complaint of undesirable side effects.

*Studied through the courtesy of Dr. David Sutherland.

CASE 3.† A dentist 56 years of age was first observed to have Paget's disease of the upper right femur in 1956. Except for a mildly limping gait, symptoms were few. The blood and urine chemical values were normal, except for slight elevation of alkaline phosphatase content. Between July and October of 1956, x-ray films showed decided progression of the disease process. Two areas of radiolucency resembling fissure fractures appeared at the lateral margin of the upper femur (see Figure 2, a). Weight-bearing was minimized in order to lessen the danger of fracture, and treatment with anabolic steroid hormones was begun. The alkaline phosphatase level in October 1956 was 20.5 Bodansky units, and there was a 3 plus reaction to a urinary Sulkowitch test with the patient on a diet without milk or cheese. Thereupon a high protein diet, free of milk and cheese was prescribed with the addition of ascorbic acid. Delatestryl® was administered, 2 cc. every three weeks. X-ray films in December (Figure 2, b) showed further intense demineralization of the entire femur, probably due to the immobilization of the patient. At this time the alkaline phosphatase was 31.4 Bodansky units, and the urinary Sulkowitch test reaction was nil. Treatment was continued for several months, and since the patient had little pain, weight-bearing was permitted. X-ray films taken in June 1957 (Figure 2, c) showed intense recalcification of bone. Since the urinary calcium and serum

†Studied through the courtesy of Dr. Floyd H. Jergesen.

calcium levels were low, while the alkaline phosphatase level was still elevated, vitamin D 50,000 units, was added twice weekly. Receiving 2 to 3 cc. of Delatestryl[®]* alternating with Deladumone^{®†} every four to six weeks, the patient continued to do well and was fully ambulatory. X-ray films in October 1958 (Figure 2, d) and later showed little bowing. The previously noted fissure fractures remained virtually unchanged. In spite of the large doses of anabolic hormones there were no side effects.

DISCUSSION

A better understanding of bone physiology, largely due to the work of Albright, has pointed the way to the need of agents to enhance bone anabolism in order to heal the lesions of Paget's disease. The anabolic steroid hormones are the best available agents to date to affect bone matrix and osteoblastic activity. They lessen hypercalciuria from increased bone breakdown, promote healing with rise of the serum alkaline phosphatase level and lessen bone pain. While they promote healing of fractures and slow the progress of the disease, they do not seem to stop it. A combination of male and female hormones, employed in a manner similar to that used in the treatment of osteoporosis, seems effective. The newer long-acting injectable hormones appear simple, convenient and effective.

Corticotropin and cortisone, in large doses, appear to stop the catabolic phase of the disease more than they interfere with bone anabolism. The large doses employed, however, act catabolically on normal bone, and also produce undesirable side effects—psychosis and indigestion—which makes prolonged treatment undesirable. Combinations of cortisone and anabolic steroids to offset some of these effects have not as yet been explored. The effects of corticotropin and cortisone may shed some light on the etiology of Paget's disease.

The lessons learned from the physiologic events of patients with Paget's disease are applicable to a variety of bone disorders. Thus, if in any situation in which there is diminished bone anabolism with continued or enhanced bone catabolism, hypercalciuria results, the treatment of primary importance is mobilization, forcing of fluids, high protein intake and, possibly the addition of anabolic hormones. The intake of calcium containing foods, such as milk, should be curtailed, in order to lessen the hypercalciuria and the likelihood of formation of renal stones, hypercalcemia and "chemical death" from calcium poisoning.¹² There seems to be far less danger from producing a dietary calcium deficiency syndrome in adult men, than there is danger from producing calcium excess. This viewpoint is

even more cogent in view of recent papers, such as Hegsted's^{4,16} who seriously questions whether the recommended dietary calcium intakes of adults are not too high for the needs of the skeleton. While little disadvantage has been demonstrated in people consuming much smaller amounts, examples where dietary excess may lead to aggravation of existing hypercalciuria or hypercalcemia are well known, making low calcium intakes imperative, and sometimes lifesaving. The patient with Paget's disease, in the catabolic phase, and especially when immobilized, is such an example.

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*Each cc. contains 200 mg. of Delatestryl.

†Each cc. contains 90 mg. of Delatestryl and 4 mg. of Delestrogen.

Right Diaphragmatic Hernia Secondary to Trauma

With Report of Two Cases

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TRAUMATIC DIAPHRAGMATIC HERNIAS are being reported in increasing number. This is due to several factors. Automobile accidents at high speeds have resulted in more cases of severe multiple injuries, and nowadays more patients survive as a result of advancing knowledge in the early treatment in such cases. Entities such as traumatic diaphragmatic hernias, once considered rarities, are now being recognized and successfully treated. Gradually, the pathological patterns associated with these injuries are becoming evident.

Since strangulated diaphragmatic hernia is of traumatic origin (Carter²) in some 90 per cent of cases, it is a condition to be kept in mind in dealing with persons who have been injured in ways that might cause the diaphragm to rupture. From 95 to 98 per cent of traumatic diaphragmatic hernias occur on the left side.⁷ The liver tends to protect the right diaphragm from rupture. When the right diaphragm is ruptured, however, the rent may be a very large one, permitting the liver to become tamponaded in the opening or part of the liver and part of the bowel to rise into the pleural cavity.

It is important that repair be done early in cases in which the liver is involved. In the case reported by Child⁴ the injury had taken place 44 years previously and it was necessary to amputate that portion of the liver above the diaphragm which had become elongated and could no longer be easily replaced. Protrusion of the liver into the thorax can considerably impair cardiovascular function. The liver mass constricts and may interfere with its own blood supply, causing early strangulation of the liver substance and bringing about pain or distress in the right upper quadrant and subcostal areas.

In many cases, pneumothorax may follow laparotomy. For this reason an endotracheal tube should always be used in any laparotomy following a massive crush injury. An unsuspected diaphragmatic opening would result in pneumothorax with serious degrees of anoxia if the anesthetist were unprepared to control the intrapulmonary pressure.

Although in most cases the injuries are received in automobile collisions, such causes as falling from a great height,⁴ being kicked in the abdomen,¹⁸ an

• With automobile accidents at high speed on the increase, some previously rare injuries are becoming more common. Rupture of the left diaphragm is fairly common. On the right, it has been believed rare. The diagnosis has often been missed for many years after the causative injury.

Any suspicious x-ray film shadow at the base of the right lung field after injury such as those that occur in accidents of great impact should arouse the physician's suspicions. A mushroom-shaped mass on the lateral x-ray view is characteristic.

Introduction of pneumoperitoneum may help in diagnosis. Only if the peritoneal and pleural cavities communicate will this procedure produce a pneumothorax.

Surgical correction is indicated in all cases. This is best done through the chest. The right lobe of the liver usually must be reduced. In general the results are excellent.

airplane crash,¹¹ a stab wound^{5,13} and a mining accident²⁰ have been reported as causes. Often the patient has numerous other lesions, particularly multiple fractures of ribs. A few have been reported with no history of previous trauma.

Diagnosis

There may be no specific symptoms referable to the ruptured diaphragm immediately after the accident, or the examiner's attention may be drawn to other serious injuries. In most of the cases reported in the literature diagnosis was not made until many years after the causative injury. The more common symptoms include pain over the chest and evidence of disturbance of cardio-respiratory function owing to displacement. Dyspnea and cyanosis, tachycardia, lowered blood pressure, mediastinal shift and signs of intestinal obstruction may occur.

In the differential diagnosis, such conditions as emphysema, eventration of the diaphragm, cystic disease of the lung, lung abscess, intrathoracic tumors, pleural effusion, chronic pleurisy and hemothorax must be considered. In many of these conditions, the preoperative diagnosis is merely of academic importance for the preferred treatment is surgical operation.

Carter² has divided the course of traumatic diaphragmatic hernia into three separate phases. Dur-

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ing the first phase, immediately following the injury, shock and upper abdominal pain, which may radiate to the shoulders, are often present. The lower chest may be dull or tympanitic. The mediastinum may be shifted. During the second phase, the symptoms are frequently vague, suggesting coronary disease, peptic ulcer, gallbladder disease or incomplete intestinal obstruction. The third phase is characterized by obstruction or strangulation of viscera incarcerated in the diaphragmatic opening.

In the relatively rare strangulated right diaphragmatic hernia, symptoms are usually vague and nonspecific.

Roentgen Diagnosis

Barium studies are of help in cases in which the stomach or bowel is involved. Following trauma, any suspicious shadows at the bases of the pleural cavities must be carefully evaluated with the possibility of diaphragmatic hernia in mind. Lateral views may be of assistance. Some investigators^{8,19} have found that pneumoperitoneum is sometimes helpful. A characteristic mushroom-shaped mass on the lateral view is outlined by the air in cases in which there is a communication between the peritoneal and pleural cavities; but if no such communication exists, pneumoperitoneum is of no assistance.

Surgical Treatment

Most investigators have expressed preference for the thoracic approach because with the abdominal incision the right lobe of the liver gets in the way. Rives¹⁸ advocated a thoraco-abdominal approach, particularly in cases of long standing with numerous vascular adhesions to the liver. In these cases mobilization of the liver through the chest approach alone may create serious hemorrhage. Manlove,¹⁵ on the basis of observations in a case of bilateral rupture, advocated the abdominal approach.

Opinion differs as to the advisability of crushing the phrenic nerve. Many surgeons recommend it, but unless the repaired diaphragm is under considerable tension the disadvantages would seem to far outweigh the advantages. As Chamberlain³ pointed out, the three reasons for paralyzing the diaphragm are to quiet the operative field, to bring about maximum relaxation of the diaphragm and thereby facilitate repair, and to promote healing. However, adequate anesthesia will sufficiently quiet the field and relax the diaphragm, and relaxation as a way to promote healing is no longer as generally subscribed to as formerly. The detrimental effects of phrenic paralysis are many and frequently severe. The loss of phrenic function will reduce the patient's respiratory reserve, will diminish the efficiency of normal bronchial peristalsis and of tracheo-

bronchial cleansing by cough. In a fair proportion of cases in which the diaphragm is "temporarily" paralyzed by crushing, it never again functions. In many cases only partial function is regained, for loss of nerve supply causes a lower motor neuron type of atrophy which may never completely reverse. A left phrenic crush often results in gastric disturbances.

Most investigators have expressed belief that it is wise to place tubes for drainage of the field after the operation, since usually it is necessary to free adhesions in the course of the procedure. This causes exudate to accumulate in the thoracic cavity, where it embarrasses reexpansion of the lungs unless it is drawn off. Drainage from tubes in place is far less distressing to most patients than thoracentesis.

Repair of the defect is usually easily done by use of mattress or interrupted heavy nonabsorbable sutures. Should the diaphragm be avulsed from its line of attachment and not enough cuff remaining for resuturing at the normal site of junction, the edge of the avulsed leaf can be attached over one or two interspaces at a higher level.⁷ In rare instances it may be necessary to remove small posterior segments of the lowermost ribs. The diaphragmatic extension into the transversalis muscle may be dissected out to obtain closure without tension. When the diaphragm is detached from the chest wall, mattress sutures through the chest may be tied over tubes on the outside. This is followed by interrupted intrapleural sutures.¹⁰

REPORTS OF CASES

CASE 1. A six-year-old girl was admitted to the San Jose Hospital on December 7, 1956, shortly after she had been struck by a truck. Upon admission she was acutely ill, slightly cyanotic and hyperpneic. The radial pulse was faint and the rate was 160. The systolic blood pressure was 50 mm. of mercury. Extensive pelvic fractures, traumatic evulsion of the urethra and bleeding from the vagina were noted. The right diaphragm was roentgenographically observed to be decidedly elevated, and it was thought then that the displacement might be caused by a subdiaphragmatic accumulation of blood secondary to a hepatic laceration, or by traumatic eventration of the diaphragm or hemothorax. No ribs were fractured. The chest expanded evenly and the lungs were clear to auscultation. Breath sounds were diminished from a point about 1.5 cm. below the nipple line on the right and were almost absent at the right base. In this area the lung field was dull to percussion. The patient complained of generalized abdominal pain. The abdomen was soft, but there were no bowel sounds. Tympany

was present over the entire abdomen, most pronounced in the left upper quadrant.

As the urethral meatus could not be located, extraperitoneal urinary extravasation was considered probable. Ruptures of the diaphragm, the spleen or the liver were considered as possibilities.

Serum albumin and later whole blood were administered and eight hours after admission the general condition of the patient was much improved. She was then taken to surgery for exploratory laparotomy. At thoracentesis on the right just before operation was begun, not more than 80 cc. of blood was removed.

At operation the floor of the urethra was found to be completely torn from the roof of the vagina, permitting continuity between the two canals. The left vaginal vault was severely lacerated. A 2 cm. linear laceration of the right lateral wall of the bladder was repaired. Then the area was drained and suprapubic cystostomy was carried out. Upon exploration of the remainder of the peritoneal cavity, 200 to 300 cc. of serous fluid was found. No evidence of blood was noted even when sponges were placed in the gutters in the region of the liver and spleen. Convalescence was uneventful except that a urinary tract infection developed. The patient was febrile from December 23 onward.

As x-ray films of the chest showed the right diaphragm still elevated, thoracentesis was carried out several times but only a few cubic centimeters of what appeared to be old blood was aspirated. It was therefore believed that an organizing hemothorax was present. Diaphragmatic herniation was considered but was thought to be unlikely in view of the absence of blood in the peritoneal cavity at the previous laparotomy. Bronchial rupture was considered an unlikely possibility.

On January 10, a preliminary bronchoscopic examination showed no evidence of bronchial injury, so exploratory thoracotomy was carried out, the chest being entered through the seventh interspace. The right leaf of the diaphragm was found to be ruptured from a point posteriorly near the diaphragmatic crura, the tear extending over the dome to an anterolateral position several centimeters from the chest wall. The greater portion of the right lobe of the liver lay in the right lower thoracic cavity. Numerous adhesions between the rolled diaphragmatic edges and the liver were readily freed with sharp and blunt dissection. There was no peel on the lung, which expanded immediately without difficulty.

After the liver had been reduced into the abdominal cavity, the diaphragmatic edges were sutured. An intrapleural catheter was inserted before closure and was removed on the second postopera-

tive day. Convalescence was entirely uneventful and subsequent x-ray films showed the diaphragm in normal position and normal lung expansion.

Comment: This case illustrates the diagnostic difficulties that may be encountered. Although strongly suspected, the diaphragmatic defect was not found at the time of the first laparotomy because the liver completely tamponaded the diaphragmatic opening, giving excellent hemostasis to the torn diaphragm.

CASE 2. A 20-year-old white man who was thrown from his car in a collision soon afterward noted sharp pain in the chest, in the right shoulder-strap area and in the right mid-abdomen. He had some dyspnea, which was more pronounced when lying down. He was in hospital from June 9, the day of the accident, until June 13. X-ray films showed pronounced elevation of the right diaphragm. The patient was essentially asymptomatic at the end of this period and was permitted to go home, with the advice that he seek further medical care.

At the time he was first examined by the authors, thoracentesis was carried out on the right side and 120 cc. of sanguinous fluid was withdrawn. X-ray films showed the right diaphragm still elevated. Tympanic dullness over the lower half of the right chest was noted and no motion of the right diaphragm was detected. There were tenderness and swelling of the right costal arch and evidence of a fractured costal cartilage in this area.

With the presumptive diagnosis of traumatic right diaphragmatic hernia, operation was done June 27. A laceration of the diaphragm was observed, extending from a point one inch lateral from the inferior vena cava, across the dome of the diaphragm to within two inches of the lateral chest wall. A large part of the liver had herniated through this defect and this organ was tightly impacted. After the liver was returned to the abdomen, the edges of the defect were approximated with No. 1 and 2-0 silk. Convalescence was entirely uneventful.

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Cirrhosis Mortality in California—A Trend

WENDELL R. LIPSCOMB, M.D., Berkeley

PORTAL CIRRHOSIS is by far the most common form of cirrhosis observed by clinicians. The clinical-pathological manifestations of portal cirrhosis or its precursors can be produced by exposure to a variety of chemicals (including alcohol) yet in many cases the cause cannot be ascribed to a specific or known etiological agent. Experimental and clinical laboratory studies have been able to link nutritional deficiency as having an etiologic role in the development of cirrhosis of the liver; but, again, definitive knowledge of the relationship between nutrition and the development of portal cirrhosis is lacking. It is the purpose of this discussion to review the trend of cirrhosis mortality in the State of California and some of the implications of this trend for clinicians and public health workers.

Deaths Due to Cirrhosis of the Liver*

A recent announcement by the Metropolitan Life Insurance Company⁵ indicated that for its policy-holding population cirrhosis of the liver was the tenth most frequent cause of death of all causes for all ages. In the State of California in the year 1956 in the age group 35 to 44 years, cirrhosis of the liver was the fifth leading cause of death; and, for the age group 45 to 54 years, cirrhosis of the liver was the third most frequent cause of death.³ A comparison of crude death rates from cirrhosis of the liver for California and the United States for the years 1950-1953 indicates that California's crude death rate was substantially higher than that for the United States as a whole (Chart 1). In this study, another feature of cirrhosis mortality in California was evident. When deaths due to cirrhosis are posted by the recording agency or physician, they may be certificated with mention of alcoholism or without mention of alcoholism. The study demonstrated that for the same years, 1950-1953, in California the ratio of cases in which alcoholism was mentioned to the number of cases in which it was not mentioned was 1:1. The study also showed that this state, with approximately 7 per cent of the total population of the nation, accounted for one fourth of

• The recorded California death experience attributable to cirrhosis of the liver for the period 1910-1957 was collected and analyzed. The analysis clearly demonstrated a progressive increase in age-adjusted death rates for the past thirty-five years, paralleled by a constantly decreasing average age at death. Increasingly, California citizens are dying of cirrhosis of the liver at younger ages.

At a time when diagnosis and treatment of cirrhosis of the liver are at their highest points of clinical interest and concern, this analysis suggests that other morbid forces are at work in the production of liver cirrhosis that must be ferreted out by clinicians and epidemiologists.

all the nationally reported deaths from cirrhosis with mention of alcoholism. Compared to California's one-to-one ratio, the United States as a whole has a ratio of reported cirrhosis deaths with mention of alcoholism and without mention of alcoholism of one to three (Chart 2). From these data an investigation of the trend of the cirrhosis mortality seemed mandatory. Insofar as data could be collected on total populations as well as on recorded deaths due to cirrhosis, these were assembled and plotted as age-adjusted death rates, and as median age at death for all age groups (Chart 3) from the years 1910-1940 and 1950.

Chart 3 shows that from a high in 1910 of 17 per hundred thousand total population, the cirrhosis death rate fell in almost straight-line fashion to a

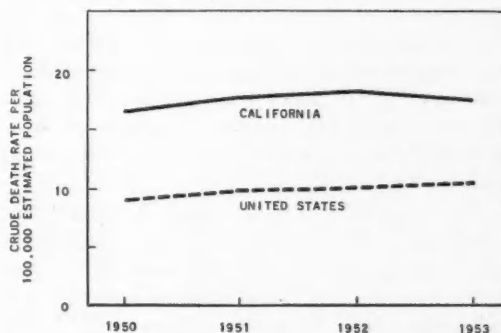


Chart 1.—Crude death rates from cirrhosis of the liver, California and United States, 1950-1953 (by place of occurrence).

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*The cirrhosis of the liver referred to in this paper is ISC 581 as listed in the *Manual of Statistical Classification of Diseases, Injuries and Causes of Death*, 6th Revision—World Health Organization, 1949.

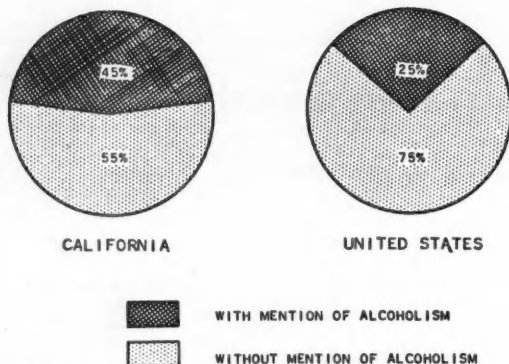


Chart 2.—Deaths from cirrhosis of the liver, 1950-1953.

low of eight in 1920; and then, from 1920 forward until 1957, gradually assumed ever-increasing upward momentum. In short, excluding the periods of Prohibition, of World War I and of the influenza pandemic of 1918, the cirrhosis death rate has consistently been climbing.

Another pertinent finding emerging from this analysis is seen in the companion chart on median age of death for age 20 and over.* The median age of death rose rapidly from the fifth to the sixth decade during the years 1910 to 1920, and since 1921 has gradually lowered until, in 1957, the median age at death from cirrhosis of the liver was 54.

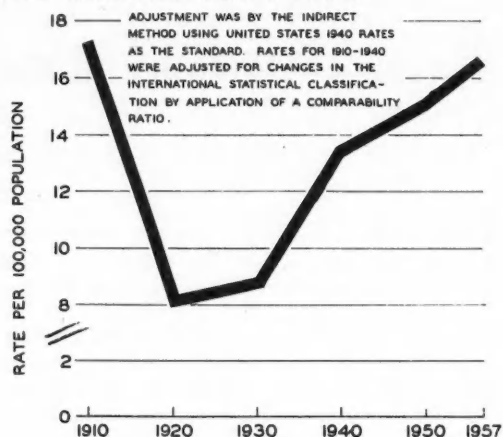
DISCUSSION

It is strikingly apparent that for the past three decades cirrhosis of the liver as a cause of death has consistently increased proportionally in the mortality data for the population of California. Similarly, over the same period the average age at which cirrhosis deaths occur has been decreasing. The question arises, what is happening to the livers of California inhabitants? Is the disease today the same disease of twenty or thirty years ago? Are we, as a population, being exposed to toxins, chemicals or living organisms with a predilection for injuring the liver? Is our way of life—professional, occupational, social and recreational—conducive to a physical health status that makes our livers susceptible to this disease?

Cirrhosis of the liver is a relatively chronic disease with a fairly long morbidity before death. Data on the average age of onset make clear the fact that it has gradually been affecting more and more persons who should be in the "prime of life." The

*The numbers of cirrhosis deaths recorded for persons younger than age 20 are less than 0.5 per cent of the total for the general population.

AGE-ADJUSTED DEATH RATES



MEDIAN AGE AT DEATH

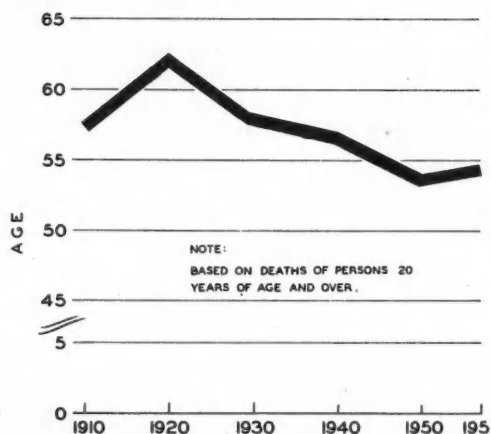


Chart 3.—Mortality from cirrhosis of the liver (California, 1910-1957).

increase, as demonstrated here, cannot alone be accounted for by improved diagnostic methods or by aging population. Improved diagnostic methods have been worked out, enabling earlier diagnosis—a fact paralleled by the advent of many new and improved treatment methods, surgical and medical. Similarly, throughout the same period there has been a qualitative betterment of diet and general nutritive state. The implication for these conditions as they relate to cirrhosis of the liver should strongly suggest a decline rather than an increase in cirrhosis death rates; or, if increases do occur they should occur in the older age groups rather than in the younger. Investigation along several lines is being carried out within the State Department of

Public Health, the results of which will be made available in the future.

For the epidemiologist, the literature concerned with cirrhosis offers several thought-provoking findings:

(a) The prevalence of cirrhosis deaths shows a great variation geographically;⁴

(b) Cirrhosis is of higher prevalence in the larger cities;²

(c) The death rate from cirrhosis of the liver is two to three times higher for men than for women.⁷

(d) Certain occupational and professional groups with ready access to alcoholic beverages appear to be higher risks in the development of cirrhosis of the liver;¹

(e) Approximately three fourths of the patients with cirrhosis give a history of chronic alcoholism; but, at a maximum, only 30 per cent of all chronic alcoholics develop cirrhosis;⁶

(f) Cirrhosis is usually linked with nutritional aberration as a precursor to or an effect of the illness.

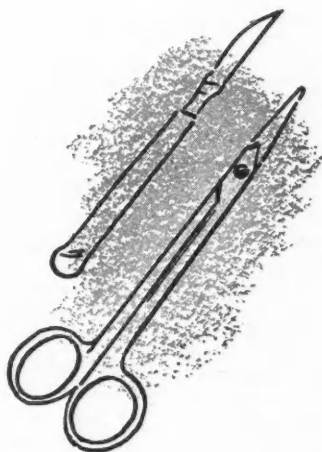
The findings of this and other inquiries show in cirrhosis of the liver a slowly progressive chronic disease epidemic, and suggest that the concerted forces from the various fields of clinical medicine

and public health focus their efforts on this disease for a better understanding of etiologic factors, natural history and, hopefully, prevention.

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Acute Appendicitis Complicating Pregnancy

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THE FIRST RECORDED CASE of appendicitis complicating pregnancy was reported in 1848 by Hancock.³ Ten days after a premature delivery he incised a perityphlitic abscess and the patient recovered. Sixty years later Babler¹ was able to compile a large series of cases from the literature. Of 103 patients with perforation 89 were operated upon. Abortion occurred before operation in 32 cases, after operation in 37, and 36 mothers died. The mothers died in all the 14 cases in which treatment was nonsurgical. There were 104 cases without perforation; 50 of the patients were operated upon, seven aborted and one mother died. Of the 54 treated without operation, six aborted and 4 mothers died.

Babler also collected reports of 28 cases in which appendicitis—with perforation in 18 cases—complicated the first ten days of the puerperium. Of patients operated upon, four died. Six were treated without operation and four died. Twelve of the 18 with perforation were operated upon and four died. Four of six treated without operation died. The other two “recovered by accident,” the pus burrowing through into the rectum. Of nine patients without perforation, three were operated upon and six were treated conservatively. All recovered. The other case in the series was reported with insufficient details for classification.

Babler¹ concluded that the treatment of choice was early operation and made the statement that “the mortality of appendicitis complicating pregnancy and the puerperium is the mortality of delay.”

An attempt was made to collect data on all cases of appendicitis during pregnancy at both the St. John's and Santa Monica hospitals. Unfortunately, the coding is incomplete, and many of the records are inadequate. Hence it was impossible to get accurate data on incidence, on diagnostic error or on the value of specific points in history or examination in making a diagnosis. In all, records of 29 cases with a diagnosis of appendicitis in pregnant women were found. In one of these cases the diagnosis was “subsiding appendicitis,” and the patient was discharged without operation. (The case was not included in this series.) There were eight cases in which the diagnosis was not confirmed pathologically. It is

• Acute appendicitis occurs as a complication of pregnancy in about 0.1 per cent of cases. Diagnosis may be somewhat more difficult during the second and third trimesters due to the displacement of viscera and the increased incidence of pyelitis and constipation. It is based on the same symptoms and signs as in nonpregnant patients.

The treatment is immediate operation regardless of the stage of pregnancy. A McBurney incision is preferred and it is placed somewhat higher than usual in the later stages of pregnancy. When operation is done promptly there is little danger to either mother or fetus.

likely that this apparent diagnostic error of only 28.5 per cent is ascribable to our inability to find the reports of all cases in which preoperative diagnosis of appendicitis was not confirmed. Of the remaining 20 cases of acute appendicitis in pregnancy, four showed perforation. There were no deaths and no abortions.

The incidence of acute appendicitis during pregnancy is usually estimated as from 0.1 to 0.2 per cent. During the period covered by this study there were 19,932 deliveries in the two hospitals whose records were scanned; and as there were 20 cases of acute appendicitis in pregnant women during the same period, the incidence was 0.1 per cent. The overall incidence computed by combining the data on the present series with those from several published series was 0.08 per cent.

Beginning at about the third month of pregnancy the appendix is displaced upward by the enlarging uterus and at the same time it undergoes a counterclockwise rotation. This was well demonstrated by Baer, Reis and Arens² who studied 78 patients with normal pregnancy and no clinical evidence of appendicitis. They made gastrointestinal x-ray studies at intervals from the second month of pregnancy to 10 days postpartum. One can easily imagine that this displacement might at times increase an already present tendency to obstruction by kinking. If this were so, appendicitis should be more common in the second and third trimesters. Several investigators have tried to relate the frequency of appendicitis to the stage of pregnancy. Joergensen⁵ said that most cases occur in the first six months, especially the second trimester, when the appendix changes from a pelvic to an abdominal organ. However, he did not

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give statistics to support that statement. Hoffman and Suzuki⁴ reported 16 cases in the first trimester, 18 in the second and 11 in the third. In Meharg and Loop's⁶ series the distribution according to trimesters was seven, two and two. In the series herein reported, the distribution was about equal. Of course, these series are too small to be statistically significant.

Joergensen⁵ said that a pregnant woman is more susceptible to recurrent appendicitis and that the incidence is between 1 per cent and 2.5 per cent. This is ten times the usually stated incidence of appendicitis in all pregnant women. Joergensen expressed belief that an interval appendectomy should be done in pregnant women who have a history of previous attacks of appendicitis. This seems a rather radical view, particularly when one considers the difficulty in evaluating a story of past attacks of abdominal pain. Joergensen⁵ did not give statistics to support this belief. In the present series no comparison could be made on this point, since most of the records did not mention previous attacks.

Some observers have tried to relate parity to the frequency of appendicitis. Meharg and Loop⁶ said that "the incidence of appendicitis is inversely proportional to the parity and gravidity." But Joergensen⁵ held that "parity plays no part." This is another point we are unable to clarify, as half of our records did not note whether or not there had been previous pregnancies.

The signs and symptoms of acute appendicitis are essentially the same in pregnant as in nonpregnant patients, although in the later stages of pregnancy the appendix may be situated somewhat higher than usual. Baer, Reis and Arens² said that the point of maximum tenderness is always over the appendix. On the other hand Meharg and Loop⁶ stressed that the pain and hyperesthesia are low over McBurney's point in spite of the upward displacement of the appendix. In the present series there were 14 cases in the second and third trimesters. In 13 of these there was a history of localization of pain in the right lower quadrant of the abdomen and in ten the maximum tenderness on physical examinations was also in that area. It has been our experience that the pain and tenderness are often localized at McBurney's point, regardless of the anatomical position of the appendix. This is sometimes noted in cases of incomplete rotation of the colon and even in situs inversus viscerum.

In the present series the body temperature at the time of admittance ranged from 99.0° F. in some cases to 101° F. in others. The average was 98.0° F. and in 9 of the 20 cases it was recorded at 98.6°. Leukocytosis was almost always present. In patients with perforation the lowest leukocyte content was

TABLE 1.—Mortality Data on Cases in Which Appendectomy Was Done During Pregnancy

Data from	Cases	Maternal Deaths	Fetal Deaths
Hoffman and Suzuki ⁴	126	1	9†
Walker and Greaney ⁹	49	0	4
Mussey and Crane ⁸	122	2	2
Meiling ¹	26*	2	Not stated
Present series.....	20	0	0

*Includes only cases in which preoperative diagnosis of appendicitis confirmed.

†One other fetal death, in case in which operation was not done.

6,200 per cu. mm., the highest was 25,000 and the average was 17,780. In those without perforation the range was from 9,600 to 24,900 per cu. mm. and the average was 15,574. In the cases in which the diagnosis of appendicitis was not confirmed at operation, the average leukocyte content was 9,575 per cu. mm.

It is of interest to compare the groups with and without perforation in relation to age and duration of symptoms. Those with perforation averaged eight years older than those without, which would suggest that the older patients were more phlegmatic about their symptoms and less likely to call a physician early. The average duration of symptoms in those without perforation was 19 hours, while in those with perforation the average was 71 hours. This pronounced difference in duration of symptoms is as one could expect. Although in this modern series there were no deaths, we are reminded of Babler's¹ statement fifty years ago that "the mortality of appendicitis during pregnancy and the puerperium is the mortality of delay."

The incidence of both maternal and fetal deaths varied considerably in the different series reviewed (Table 1). Most of these series are too small to have much statistical significance, but the data are in contrast with the results reported by Babler¹ in 1908.

It is generally considered that during pregnancy appendicitis is more than ordinarily difficult to diagnose. Hoffman and Suzuki⁴ reported on appendectomy in 126 of 44,242 pregnant patients. Forty-five of the patients were found at operation to have acute appendicitis—a diagnostic accuracy of 35 per cent. Meharg and Loop⁶ reported on 6,106 births and appendectomy in 25 of the mothers during gestation. The diagnosis of appendicitis was confirmed in 11 cases, giving a diagnostic accuracy of 44 per cent. They noted that this "compares favorably with the clinico-pathologic diagnostic agreement of 41 per cent on the surgical service." In the present series determination of diagnostic accuracy was not feasible because preoperative diagnosis was not coded in the available records.

As was previously noted, the diagnosis of appendicitis in pregnancy is made in the same way and

based on the same criteria as in nonpregnant patients. A history of persistent abdominal pain, usually beginning in the upper or mid-abdomen and later shifting to the right lower quadrant is commonly obtained and is characteristic. There is almost always anorexia and commonly nausea and vomiting. The characteristic findings on examination are spasm, tenderness and referred rebound tenderness localized in the right lower quadrant of the abdomen. When all of these symptoms are present the diagnosis is usually correct. It is the many atypical cases that tax diagnostic ability. In such cases the presence of pregnancy, especially in the later stages, makes the task of diagnosis even more difficult.

We feel strongly that a muscle-splitting incision (McBurney type) is the operation of choice. This may be placed slightly higher and farther to the right in advanced pregnancy because of the more pronounced displacement of the appendix. If the preoperative diagnosis proves to be incorrect, the McBurney incision can be extended or another incision made. There is little doubt that a muscle-splitting incision is less likely to lead to trouble during labor.

A variety of anesthetic agents may be used satisfactorily, but it is considered especially important during pregnancy that a high oxygen intake be maintained. For this reason cyclopropane is perhaps the agent of choice. Spinal anesthesia is very satisfactory, but it is used less often in recent years than formerly, due in part, at least, to unfortunate medico-legal implications.

The use of progestin to reduce the danger of abortion following operation during pregnancy has often been advocated, particularly during the first trimester.

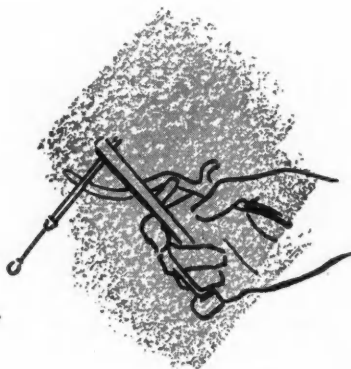
Many obstetricians now feel that this is unnecessary and ineffective. There are also some dangers associated with the use of these hormones. Wilkins and associates¹⁰ reported 21 cases of female pseudohermaphroditism following the administration of progestins during pregnancy.

There seems to be unanimous agreement that once the diagnosis of appendicitis is made, early operation is the treatment of choice whatever the stage of pregnancy. When this is done the risk to both mother and fetus is slight.

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The Intersexed Patient

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A MOST DIFFICULT and rare, although most interesting, problem for a physician is that of the "intersexed" patient—that is, one in whom there is demonstrable abnormality, anatomically and/or biochemically, especially in the urogenital system.* When the abnormality is discovered in infancy, there is the problem of how to raise this person; later in life there are the problems of whether or not to assist the patient in a change of sex. It is well known that experts (Cappon¹ and Money,⁵ for example) fundamentally disagree on these issues. The physician's determination as to the most appropriate sex is vital in shaping the patient's future. Fortunately, this decision is approached with great caution.

Kiefer⁴ has defined sex as "the overall state of body and mind by which the individual conforms to the masculine or feminine standards of normality in the named sex-determining factors [chromosomes, gonads, hormones, sex organs, and psychic pattern]. It is an algebraic summation of these factors in which no one factor supersedes the others." This is the sense in which the word *sex* will be used in this communication.

Freud, and analysts who followed, demonstrated the presence of both masculine and feminine qualities in the character structure of all people. Freud explained this as the psychological manifestation of a biological bisexuality,³ which researchers of recent years have fully demonstrated. The anatomists have shown the presence of vestigial female reproductive organs in the male, and vice versa; embryologists have traced back the presence of these vestigial organs to an undifferentiated state of anatomical sex early in the embryo; by tampering with the early formed embryo, experimental biologists have changed various aspects of its somatic sex from that which had been chromosomally determined; endocrinologists have shown admixtures of both "male" and "female" hormones in both sexes. There has been increasing interest in unusual anatomical and endocrinological anomalies usually grouped under the wide heading of pseudohermaphrodites.

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*We are not considering those cases of homosexuality, transvestism, and other related perversions where no etiological (or even concomitant) anatomic or biochemical changes have been shown and where early childhood relationships with parents have been clearly found to be etiological.

• There are at present two opposing points of view on problems of dealing with the intersexed patient (not the typical homosexual or transvestite) who has clearcut anatomical or biochemical qualities of the opposite sex. The first is that in the growing child or adult coming for treatment, the sex the patient should adopt is the summation of somatic sex. The other is that the sex role should be assigned according to the predominant psychological identification already present.

A case history of a middle-aged pseudohermaphrodite, castrated in youth but raised from birth as a female and living thus in "homosexual" relations with women until examined and interviewed at UCLA Medical Center is presented to illustrate the psychological problems in sexual identity with which the patient had to cope.

Psychiatric investigation revealed how confused the patient's sex identity was until treatment by a team consisting of psychiatrist, psychologist and endocrinologist permitted the patient, even at so late a date, finally to establish what his gender is. The patient was able, despite early rearing as a female and a castrating operation, to swing to a more masculine identification. This was possible because of some uncertainty of sexual role from an early age.

Persons with such anomalies may have clearly defined external genitalia of one sex, yet have disturbances in endocrine function which would be commensurate with that sex and with gonads of the opposite sex.

To which sex should these patients be assigned? It is no longer possible simply to assign a person to sex according to the appearance of the external genitalia. Although the vast majority of persons clearly fall into one category or another, the unusual case is much less clear. Instead of using a single criterion as the determining factor in such assignment, recent investigators have been concerned with a number of variables. These are usually divided into two categories, the somatic: (1) chromosomal sex, (2) gonadal sex, (3) hormonal sex, (4) external and internal genitalia, (5) secondary sexual characteristics, (6) body habitus; and the psychological, that is, the sexual identification the person has made.

Two opposing points of view, both based on seasoned research and inquiring thoughtfulness, appear in the literature. The first is exemplified by Cappon,¹ who, in a report on a series of 17 intersexed patients, concluded: "When all the components are

added up, if the physical person has one gender, the mental person has the same gender. It was concluded that they must have a common source. . . . It also follows that sex assignment and rearing should always be in the direction of the preponderant somatic sex. . . . We advocate correcting any area in upbringing and in physiology and anatomy always in the direction of preponderant somatic sexuality to the extent of possibility and as soon as possible. . . ."

An opposing viewpoint is expressed by Money and the Hampsons,⁵ who were of the opinion that somatic gender is much less significant than certain psychological measurements in determining a patient's sex and in thus influencing the physician's decision as to which way to help the patient direct his development.

"From the sum total of hermaphroditic evidence," these investigators said, "the conclusion that emerges is that sexual behavior and orientation as male or female does not have an innate instinctive basis. . . . Sexuality is undifferentiated at birth and . . . becomes differentiated as masculine or feminine in the course of various experiences of growing up. . . . Though gender imprinting begins by the first birthday, the critical period is reached by about the age of 18 months. By the age of two and a half years gender role is already well established."³ Their conclusions were based on the study of 105 intersexed patients.

In another communication the same investigators said that "once a person's gender role begins to get well established, an attempt at its reversal is an extreme psychological hazard."⁶ They expressed belief that in the neonate and young infant, sex assignment is best made on the basis of external genitalia, and later hormonal and other treatment can be given as indicated. For older children, they strongly recommended that the child be left in the same sex as that originally assigned.

We have studied in a research-therapeutic relationship a patient with very anomalous sexual identifications. The patient was a 50-year-old, white, single person who presented herself* as a "butch"† when first referred to the Department of Psychiatry for research study. The patient was seen about once a week for two years.

At the time she was first seen, the patient considered herself a woman and had been brought up as a female from birth. Although some peculiarity of her external genitalia was noted by the physician who delivered her, no question was raised about her sex. The parents were told she was a girl, the birth certificate issued was for a female and she was ap-

propriately named. From birth on, she was considered a girl by her parents, neighbors, and friends and was treated as such. In her dress, the way she wore her hair, her mannerisms and companions, she was treated as and felt herself to be a girl. However, as she grew, she developed external genitalia consisting of a "clitoris" longer than the average girl's but shorter than a boy's penis, with first degree hypospadias, swollen "external labia" and a pencil-width opening an inch or so in depth between the labia.

Family history indicated that at least five other members of the patient's maternal family, and her mother and sister, had anomalies in genital structure.

The patient considered herself to have been a very active child and to have preferred boys' games as far back as she could remember, although she was given dolls and dishes. "I was always thinking of adventurous things that took nerve and daring, like driving racing cars and speed boats, to learn about guns and hunting—but I always thought of myself as a woman doing these things, not as a man."

The patient's mother was described as a meticulous and shy woman, pessimistic and cold, without signs of affection. The patient had no memory of ever having been held or comforted by her mother and felt that her mother wanted neither herself nor her sister. Her mother never enlightened her about sexual matters. Twice during the patient's childhood, her mother was hospitalized for mental illness, for about three weeks each time. The patient said she had noticed no abnormality and did not know why her mother went to the hospital.

She felt much closer to her father, considering him a kind, harassed man who was unable to cope with his wife's sexual and emotional frigidity. He passively retired from dealings with his wife and to a certain extent from the upbringing of the children. He was as restrictive of any conversation regarding sex as was her mother.

Relations with her sister are affectionate. She felt that her sister had been even more shy and retiring than she was because of the peculiarities of their sexual development. For a number of years they lived together. Although they worked and mingled with people at work, they tried whenever possible to isolate themselves from others. The sister was tall, muscular, heavy-boned and had a heavy beard, although thinking herself a woman. The sister had the same physical malformations the patient had; she was considered a female by the delivering physician and was so named and reared.

Sexual History

Despite the patient's appearing to have an unbroken memory to earliest years, there was a specific amnesia for early childhood sexual experiences

*In order to make easier the reader's empathy with the patient's own identification, the patient will be referred to as "she" for all events before the change to "he."

†Tough, male-imitating female homosexual.

and feelings. However, there were two memories from around the age of five, the first of a neighbor boy undressing the patient and their each looking at the other's genitals. This was interrupted by the patient's mother, who spanked her. The second memory at this age was trying to urinate while standing up, but "everything backfired and I realized I wasn't supposed to go in that manner." This "realization" was reinforced by watching girls urinating sitting down.

At the age of ten, a neighbor boy attempted intercourse with her, despite his being nonplussed at his inability to find a vagina. This activity caused the patient to have her first orgasm, with ejaculation.

Puberty occurred around the age of twelve, with changes in secondary sex characteristics (without the development of breasts) and an increased sexual desire, invariably directed toward girl friends and women teachers. Masturbation began not long after, with fantasies always related to girls, especially regarding breasts. Wet dreams, which were always about women, occurred one or two times a year. During adolescence, the patient had a number of crushes on school friends and teachers and had a few relationships with girls in which there was hugging and kissing but no genital contact.

During adolescence she felt nothing unusual about the fact that she had erections and emissions, assuming that this occurred with other females. She grew tall and muscular, became very interested in athletics, and was considered a superior athlete on the girls' teams in high school, although not the most proficient of all the girls. Somewhere after the age of fourteen, her feeling that her genitals were the same as other girls' but just precocious, and that their clitoris was inside and would grow out in time, became an uncertainty. In the gymnasium she gradually became aware that the other girls looked at her and would comment and giggle about her in a hidden although at times teasing manner. She soon realized that this was related to her genitalia. Although she continued friendly with these girls, she began to withdraw, feeling that the others were looking on her as a freak. As time passed, she realized that the others not only did not but probably would not develop as she did and that the others had breasts that she did not. This gave her a desperate, hopeless, trapped feeling, which persisted more or less constantly up to the time she was first seen by us.

At the age of eighteen she was discovered during a physical examination for cystitis to have unusual genitalia for a female and so was referred to a university medical center, where the external genitalia were removed. No reconstruction in the direction of a female perineum was attempted, although the patient was offered the opportunity. Following the

operation, some growth of the stump occurred. Sexual sensation disappeared in the stump for one to two years after operation but then returned.

The first overt sexual experience as an adult occurred when she was in her twenties. Since that time, she has had many affairs, some passing and some lasting for months. Except for a single, incomplete sexual experience with a man (which did not include genital contact) her adult sexual relationships were exclusively with women. This led to the patient's social and sexual life being tied up completely with homosexuals, with all social contacts occurring either in homes or in homosexual bars and clubs. The patient never questioned her being a homosexual nor did any of those with whom she associated. Had she not considered herself and been considered to be homosexual, she would not have been fully accepted in their company. The only women with whom she ever fell in love were those who were considered in homosexual circles to be "normal"; that is, they were women who dressed and acted feminine, who had been married, and most of whom had had children, and had entered into homosexual relations only in middle life. These close and affectionate relationships were few, and preferably with women somewhat older than herself.

Pertinent Medical History

From birth to the age of 18, the patient's medical history relating to her present illness is not significant. At the time of her castration, a masculine habitus and secondary sex characteristics, rudimentary testes, and rudimentary penis with first degree hypospadias were found.

It was felt at this time that the operation was indicated because the patient had been raised as a female and for that reason would necessarily have to continue so.

In our examination at the University of California at Los Angeles, the patient was observed to be a castrated male without body or facial hair, with delicate hair on the head, and masculine, although softened, body build. Results of endocrine studies were those to be expected for a male castrated at 18.* Cystoscopic examination demonstrated a verumontanum and a very small prostate. A specimen of buccal cells and a biopsy of thigh tissue revealed male chromatin staining.

The psychiatric examination was not remarkable except for evidence of problems in psychosexual identification, in the absence of abnormal findings. The patient was an intelligent, cooperative, warm and friendly person who showed no evidence of

*17 ketosteroids and 17-Hydroxycorticoids are normal but pregnanetriole is slightly elevated. (17 ketosteroids: 17.8 milligrams; normal 6-15 milligrams. Pregnanetriole: 3.9 milligrams; normal up to 3 milligrams. 17-Hydroxycorticoids (Glenn-Nelson): 5.7 milligrams; normal 2-6 milligrams. Follicle stimulating hormone: greater than 80.)

latent or overt psychosis. Whenever the patient displayed affect, it was quite appropriate—for example, sadness when discussing a long life of being widely different from normal people, or joy with the firming up of sexual identification in the latter part of her discussions with us.

Psychological Testing

Tests employed were the Minnesota Multiphasic Inventory, Rorschach, Thematic Apperception, Sentence Completion Test, Wechsler Adult Intelligence Scale, Bender Visual-Motor Test, and a Q Sort (devised by the authors and to be reported on fully in another publication*). These revealed a person of superior intelligence and imagination, well able to use these potentials despite feelings of clumsiness, inadequacy and ineptness. Many perceptions with anxiety of mangling or destruction of the body and concern about body function were present as if this were a freshly experienced threat. There was no evidence adequate to identify the patient as homosexual.

In day to day adjustments, the patient was revealed as mildly anxious, ruminative, reserved in social interpersonal relationships but competent to deal effectively with them. Diagnostically, despite the concern over castration, the patient could be considered a normal individual with anxiety features, or as a mild anxiety neurotic.

Changes in Identification

The easiest way to measure the patient's change in identification since first being seen for this research project is that in the beginning all who knew the patient, without thinking, considered her a female. Now, no one can feel the pronouns "she" and "her" appropriate. When first seen, and for some months afterward, the patient dressed in tailored slacks, brightly colored and feminine blouses with falsies underneath, and sandals, wore jewelry and lipstick, and had plucked eyebrows and long, fine, pompadoured and carefully kept, dyed, golden hair. Bit by bit, each of these was given up. He wore shoes, men's slacks, sport shirts, which, although colorful, were typical of Southern California culture. There were no more bracelets, no makeup, no dyed hair; his hair was cut short and by a barber. When going out, he wore suits and ties for the first time in his life.

The change in identification was not confined to easily modified changes in external appearance. In addition, there was a change from delicate effeminate mannerisms, in the way he spoke, walked, blew his nose, in the phrasing of words, in timber of voice and in a host of nonverbal communications which made him indistinguishable from any gentle but vigorous man. Although there were some evi-

dences of mild passive dependency, they were not sufficient even for a diagnosis of this character structure.

For the first time in his life, he became involved in an enduring relationship with a woman (who played a very significant role in assisting him in changing his identification), whom he hopes to marry if he can legally change his sex to the biologically correct one.

DISCUSSION

Although there are many aspects of interest in this case, we will restrict ourselves to only two.

The first concerns the patient's sexual identity. Should one consider him primarily identified with a homosexual or heterosexual role previous to our study? He considered himself to be a homosexual throughout his life (until the last year or so) and was likewise considered as such by his friends, by his sexual partners and by society. He identified with the mores of the homosexual, was fearful of the social consequences of such behavior, restricted his friendships almost exclusively to homosexuals of both sexes, chose his clothes on the basis of homosexual identification and was totally imbued with the homosexual milieu in which he lived for the greater part of his adult life. Thus on the one hand he has been clearly a homosexual. On the other hand, throughout this whole period he was biologically a male. It is therefore necessary, in biological terms, to consider him to have been exclusively heterosexual. With the exception of a very few transient relations with males (and none of these adult genital male contacts) and occasional dreams of this nature, he derived sexual excitement and gratification, both in fantasy and in object relationships, exclusively with females. This is not purely a semantic problem. It goes to the heart of the continuing discussion regarding problems in sexual identification: Are these profound problems in sexual identification due to constitutional causes or to identifications derived from interpersonal relationships starting from infancy and reinforced through adult life?

The material we have available does not permit an adequate answer, although it is sufficiently rich that bias on either side of the question can find comfort. The evidence is clear that from an early age, our patient, although considered a girl by his family, had some questions about his own identification. Thus from an early age he had masculine fantasies, masculine games, and took females as sexual objects. Is this to be considered the effect of subtle biological causes or can this be considered to have resulted from disturbances in the family which, in their turn, produced intrapsychic disturbance?

*Not yet scheduled for publication.

The typical "butch" female homosexual is biologically a female, imitates men and gives a history of very early homosexual leanings. Our patient had an almost identical career and was taken for a "butch" throughout his adult life. However, the quirk is that this typical "butch" is in fact biologically a male. Thus it is possible to confuse the issue of the biological etiology of homosexuality.

Our patient to all appearances was a "butch." He was different from other "butches" only in that he was biologically a male (except for the effects of castration). Thus, despite a very discrepant constitution, his sexual identity was as confused as that of a "butch." One cannot with certainty ascribe his identity primarily to his constitutional sex, since some female homosexuals take the same identity from childhood on. Nonetheless, one wonders, without adequate evidence, if this patient may not have been propelled, almost against his wishes, by his biological sex. Whether he was compelled to his sexual identifications by unconscious forces of a primarily biological nature or by unconscious forces of a primarily psychic (disturbed identifications in the family) nature has not been determined by our methods.

The second problem is that of treatment of the intersexed patient. Our patient was highly motivated, intelligent and possessed since childhood of some questions as to whether he was as normal a female as the rest of the girls he could observe. Thus, a foundation for changing to a more masculine attitude was present by the time we began working with him. Were his identifications more fixed in the direction of being a female, it is doubtful that he could have passed over to maleness so untraumatically; it is even more questionable whether he would have wanted to. It is well known that girls suffering from hyperadrenocorticism, although both chromosomally and gonadally female, will appear in all regards completely different if one was brought up as a girl and the other as a boy.⁴

It would seem wise, when one is dealing with an intersexed patient, regardless of the etiologic background, to have a careful psychological and psy-

chiatric investigation as well as a very complete physical (including endocrinological) examination. When it is determined that the person is unequivocally committed to one sex, then the greatest caution must be used before trying to disturb this commitment. However, when there is evidence that the commitment is not clearcut (as is evidenced by our patient), then an extended workup and psychiatric treatment should be invoked, with close cooperation with other specialties to assist the patient in determining on his own to which sex he would like to belong thenceforth.²

Thus, we do not fully agree with the point of view that it is advisable to transmute all intersexed patients to their somatic sex, nor do we agree with the point of view that all intersexed patients should remain in the identification which started in childhood and persisted into adulthood. We rather believe that at times the one will be indicated, at times the other, and that the essential criterion is the strength of the patient's identification with one sex or the other. It is our belief that this can only be determined with most careful psychological and psychiatric evaluation and that no plan of treatment, in intersexed children or adults, should be embarked on until the question of sexual identification is clarified.

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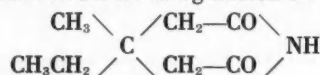
A Barbiturate Antidote

Use of Methylethylglutarimide in Barbiturate Intoxication and in Terminating Barbiturate Anesthesia

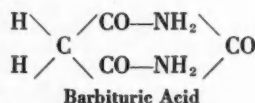
MILTON J. MARMER, M.D., Beverly Hills

BARBITURATES are among the most commonly used drugs in the practice of medicine, especially in anesthesiology. The degree of respiratory depression produced is dependent not only on the dosage but is also influenced by the effect of preanesthetic medication. This may be additive to the depression of respiration which accompanies the administration of barbiturate anesthesia. There has long been a need for an effective, prompt-acting barbiturate antagonist which could be used safely and routinely, particularly in emergencies, to reverse the depressant action of barbiturates.

Mikedimide® is chemically 3,3-methylethylglutarimide and has the following structural formula:



It is related to the barbiturates by a similarity of the ring system:



The exact mechanism of its action remains undetermined. Early reports seemed to suggest that methylethylglutarimide was a direct and specific barbiturate antagonist which acted as a competitive inhibitor of barbiturates. Evidence does not seem to support this idea. It is more likely that the drug acts as a central nervous system stimulant, possibly through the ascending reticular activating system. It is evident, however, that it has effect at a dosage range below that which may produce cerebral irritation.

Methylethylglutarimide has a high therapeutic index. It has been used in animal and human clinical trials in Australia, Great Britain and Europe. Experimental work in laboratory animals has demonstrated that the drug is a respiratory stimulant specifically in the presence of barbiturates. In animals, it has been shown to antagonize the effects of barbiturate

• Methylethylglutarimide was administered to 488 patients ranging in age from 7 to 89 years, in a study on sleep-reversal after barbiturate anesthesia. Sodium surital or sodium pentothal were the barbiturates used. The drug was administered intravenously in doses varying from 25 to 200 mg. Dosage below 25 mg. was found to be ineffective. Almost all patients showed signs of awakening as evidenced by the return of corneal and conjunctival reflexes, the opening of the eyes, and stirring or moving about. Many responded to questioning. Almost all showed evidence of greater responsiveness within five minutes. No untoward reactions were noted. No convulsions were produced.

Five patients ranging in age from 24 to 70 years were treated for barbiturate poisoning with Mikedimide® given intravenously in doses varying from 550 mg. to 1950 mg. All recovered consciousness within 30 minutes to an hour. No convulsions were produced.

While it is not known whether Mikedimide is a direct barbiturate antagonist, or whether it is an analeptic, it appears to be a useful drug in reversing the respiratory depression and the cerebral depression produced by barbiturate intoxication and barbiturate anesthesia.

anesthesia, halving the sleeping time. In unanesthetized animals it may produce muscle fasciculations and possibly convulsions. Methylethylglutarimide will increase the rate and depth of respiration, as well as produce a rapid return of reflexes.

The reported manifestations of toxicity have been retching, vomiting, muscular fibrillations and, on electroencephalographic tracing, the characteristic spikes of cerebral irritation. The drug is excreted unchanged in the urine.

The clinical trial of this drug in human beings has been limited, although Shaw¹¹ first reported on its use in 1954.

Wyke and Frayworth¹⁴ reported on the use of methylethylglutarimide in 52 patients anesthetized with barbiturates. They concluded that the drug rapidly changed deep levels of anesthesia to very light levels and eliminated the dangers of delayed postoperative recovery from barbiturates. Both the rate and the depth of respiration were increased. Kaufman⁷ did a controlled study of 90 patients for

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dilatation and curettement. Excluded were patients who needed any suturing and those with systemic disease. All the patients were anesthetized in the identical way, using 400 to 500 mg. of thiopental sodium, 40 mg. of gallamine and a three-to-one mixture of nitrous oxide and oxygen. Fifty mg. of methylethylglutarimide was used as antagonist. The results reported by Kaufman did not confirm earlier findings of other workers. Bentley and Savidge¹ reported on 100 cases. They administered 500 mg. of thiopental and 50 mg. of methylethylglutarimide simultaneously. With both used together there was less respiratory depression, no laryngeal spasm and recovery was quicker. They concluded that methylethylglutarimide shortens the duration of action of barbiturates without affecting the anesthetic potency.

The present study was undertaken in an attempt to clarify the effectiveness of Mikedimide (methylethylglutarimide) in terminating barbiturate anesthesia, in a large scale trial.

METHOD

Four hundred eighty-eight consecutive patients who could be anesthetized with intravenous thiamylal sodium, succinylcholine, nitrous oxide-oxygen technique were studied. The patients were accepted regardless of surgical procedure or medical condition. It was the choice of anesthesia only that determined inclusion in this series. Premedication consisted of meperidine 25 to 75 mg. and atropine or scopolamine 0.2 mg. to 0.4 mg., the dosage varying according to age and weight. All patients were anesthetized with 200 to 400 mg. of thiamylal for short procedures and as much as twice the amount of drug for more prolonged operations. Succinylcholine was used by continuous drip infusion (0.2 per cent), back titration being practiced throughout to prevent overdosage. Succinylcholine was discontinued soon enough to permit return of respiration and to permit pulmonary ventilation to be adequate without assistance. Nitrous oxide-oxygen, usually in equal parts, but in no instance less than 30 per cent oxygen, was used for analgesia. Toward the end of the operation, nitrous oxide was discontinued and the patient was permitted to breathe oxygen only for 3 to 5 minutes. In order to avoid the possible stimulus of a hypodermic injection, all anesthetic procedures were begun with a continuous intravenous drip of 5 per cent dextrose in water. The Mikedimide (0.5 per cent in a sterile saline solution) was injected into the rubber tubing which is part of the infusion apparatus. All patients were anesthetized by the same anesthesiologist.

The patients ranged in age from 7 to 89 years. Most of them were between ages 20 and 65 years.

Operative procedures varied from incision and drainage or uterine dilatation and curettement which lasted from 15 to 20 minutes, to a bilateral radical mastectomy lasting 8 hours. The following list shows the kinds of procedures and the number of each:

65 Dilatation and curettement	11 Bronchoscopy
59 Breast biopsy	10 Cervical repair
34 Radical mastectomy	10 Cystoscopy
1 Bilateral radical mastectomy	1 Foreign body in foot
3 Simple mastectomy	1 Epiphyseal separation
30 Pelvic laparotomy	3 Nephrectomy
36 Thyroidectomy	2 Nephropexy
9 Tonsillectomy and adenoidectomy	3 Mastoidectomy
26 Lumbar laminectomy	2 Mastopexy
5 Cervical laminectomy	3 Axillary dissection
26 Colon resection	3 Hip fracture
34 Cholecystectomy	3 Tendon repair
38 Hernia repair	2 Undescended testis
28 Hysterectomy	2 Removal calcific deposit of shoulder
11 Closed reduction of fracture	1 Glossectomy
8 Incision and drainage	1 Suture perineal laceration
12 Appendectomy	1 Arthroplasty of elbow
	1 Cystocele repair
	1 Otoplasty
	1 Vulvectomy

RESULTS

As has been mentioned, Mikedimide was administered by intravenous injection routinely at the end of the operation. When the study was first begun, 25 mg. was injected. This was found to be completely ineffective. When the dosage was increased to 50 to 100 mg., almost all patients (420) showed signs of arousal within one to three minutes after injection. The remainder (68 patients) required 150 to 200 mg. of Mikedimide before arousal and took between 2 and 5 minutes to react. The latter patients had received intravenously total doses of barbiturate varying between 500 and 800 mg. The majority of patients received doses between 200 and 400 mg. of barbiturate.

The criteria of arousal were:

1. The return of corneal reflexes.
2. Change in rate and depth of respiration.
3. Movement of extremities.
4. Response to command.
5. Return to consciousness.

Corneal reflexes: Barbiturates generally eliminate the corneal reflex. After injection of Mikedimide, corneal reflexes returned within 60 to 120 seconds. The corneal reflex remained active after return and no regression occurred.

Respiration: Almost immediately after injection of Mikedimide, there was evident an increase in the depth and rate of respiration. Every patient responded in this way. The increase in depth was more discernible than the increase in rate. Patients

who did not have oropharyngeal airways inserted under local anesthesia, rejected the airway after Mikedimide was administered.

Movement of extremities: This was an inconstant reaction. Only 50 per cent of the patients began to move their arms or legs after Mikedimide injection. Those who did, moved them in a coordinated manner. No athetoid movements were noted.

Response to command: Four hundred patients (82 per cent) were able to respond to the commands, "Open your eyes" and "Show me your tongue," within two minutes.

Return to consciousness: This was the most difficult phase to evaluate objectively because of the variety of criteria which can be used and which would be accepted as proof. Total orientation and awareness of the environment does not take place until 30 to 40 minutes after injection of Mikedimide. Despite the fact that 60 per cent of the patients studied could respond by asking questions such as, "Is it all over?" or "Am I all right?", almost all patients tend to regress to a state of light narcosis within ten minutes after injection of the drug. However, these patients then can be aroused or awakened very easily. They will respond to command and to the calling of their names. This makes care in the recovery room much simpler. Another aspect of the problem of consciousness involves memory. Almost all patients are amnesic for the period of recovery from anesthesia. For example, a patient who is told after breast biopsy that the lesion was benign may respond with a smile or verbal expression of joy, yet not clearly remember having been told anything, and ask again in the recovery room.

COMPLICATIONS

None of the toxic effects described in the literature,^{8,12} such as vomiting, muscular twitching, convulsions, hallucinations and psychotic episodes were observed in the present series. The doses used were far below any possible toxic range. One reaction was noted that has not been previously mentioned in the literature. It is described here because it occurred, although there are many factors involved which make indictment of the drug very doubtful. In one patient, anesthetized for cystoscopy, severe phlebitis of the lower basilic vein of the forearm developed three hours after injection of Mikedimide and lasted for two weeks. It must be stated, however, that on the previous day the patient had received an intravenous injection of radiopaque dye for intravenous pyelography and complained of pain at the site of the dye injection before he was anesthetized. It probably was ill advised to use a vein lower down in the same arm. The drugs injected through the vein which later became involved

by phlebitis, were 5 per cent dextrose in water, 350 mg. of thiamylal sodium and 100 mg. of Mikedimide. After two weeks the phlebitis, which was delimited at the elbow, subsided.

BARBITURATE INTOXICATION

Acute barbiturate poisoning is an ever increasing social and medical problem.⁶ In the last ten years there has been a rise in the number of cases of self-induced intoxication by means of barbiturate overdose.¹³ The unconscious patient always presents a serious problem in management.⁴ It is agreed that barbiturates produce their deleterious effects in three ways: Prolonged coma; loss of homeostasis due to vasomotor depression; and respiratory depression.¹⁰ Renal failure and respiratory failure are the common consequences.⁹ Most deaths are due to respiratory paralysis.

Knowledge of the blood level of barbiturates is of very limited value in guiding the therapy in these situations. Treatment must be directed toward overcoming coma, cardiovascular collapse and depressed respiration. Adequate oxygenation and proper transport to the tissues is of prime importance. A patent airway and adequate tracheobronchial toilet must be maintained. If necessary, endotracheal intubation should be performed. Supportive intravenous therapy plus vasopressors and antibiotics may be needed. Hemodialysis may be an effective way of cleansing the blood of the barbiturates.

Methylethylglutarimide is a valuable adjunct to other methods of treatment. There is no doubt that it represents an important advance in the therapy of barbiturate coma.⁵ It is very useful in bringing patients to a safe physiological state by stimulating reflex activity and respiration. Although it does not seem to influence the rate at which barbiturates are eliminated, it does have a central stimulating action. It is twice as effective as pentamethylenetetrazol as a cerebral stimulant.² Treatment with methylethylglutarimide results in clinical improvement and concomitant change in the electroencephalogram.³

Following are brief reports of five cases of barbiturate intoxication in which the patients were resuscitated with Mikedimide:

CASE 1. The patient, a 24-year-old woman in deep coma when admitted to hospital, was supposed to have taken 2.0 gm. of pentobarbital. She was hypotensive, totally areflexic and had pronounced cardiac irregularity. Respiration was decidedly depressed. Administration of oxygen and metaraminol was begun. The condition of the patient began to deteriorate rapidly. Four hours after admission, Mikedimide therapy was begun. Within a period of five minutes, 300 mg. was injected intravenously. Respiration increased in rate and depth. Corneal reflexes re-

turned and the patient began to cough. After injection of 500 mg. of the drug in a period of ten minutes, knee jerks could be evoked. Over a period of two hours, 1,950 mg. of Mikedimide was administered. All reflexes returned and the patient began to open her eyes. She no longer tolerated pharyngeal suction without objecting. Respiration was adequate and the patient had been brought to a safe state. Four hours after Mikedimide administration was begun she responded to her name and could speak although she was very reluctant to do so. She recovered completely.

CASE 2. A 30-year-old woman was admitted to the hospital eight hours after she was supposed to have taken a large quantity of secobarbital. Analeptic therapy had produced no effect. She was entirely areflexic. Mikedimide therapy was then begun and after 250 mg. was injected intravenously, the rate and depth of respiration increased and the corneal reflexes returned. A total of 900 mg. was administered over a period of one hour and the patient was by then reacting to the calling of her name. She recovered completely.

CASE 3. A 34-year-old woman was admitted in coma presumably owing to pentobarbital intoxication. Within an hour after administration of 550 mg. of Mikedimide, there was a return of reflexes and normal respiration. Consciousness had returned. The patient recovered completely.

CASE 4. A 50-year-old woman was admitted in deep coma. Respirations were very shallow. Supportive therapy was begun but the patient did not respond. Four hours after admission, 650 mg. of Mikedimide was injected intravenously. Recovery of reflexes, improvement of respirations and return of awareness occurred within one hour.

CASE 5. A 70-year-old man was admitted in deep coma due to phenobarbital intoxication. He was supposed to have taken 1.5 gm. of the drug. Reflexes could not be evoked. Supportive therapy was begun and Mikedimide was administered. After 300 mg. of the drug had been injected, the patient began to react. Respirations had increased in rate and depth and corneal reflexes returned. A total of 650 mg. of Mikedimide was given and the patient was returned to a safe state; respiration was adequate and reflexes active, and there was response to auditory stimuli. The patient recovered completely.

DISCUSSION

The action of Mikedimide in counteracting respiratory depression is very striking. It is very unlikely that methylethylglutarimide acts by competitive inhibition of barbiturates in the same way

that nalorphine does against morphine. Nevertheless, Mikedimide will stimulate respiration and produce a state of wakefulness. Barbiturates not only depress the response of the respiratory center to carbon dioxide but probably produce sedation by interfering with the activity of the ascending reticular activating system, which accounts for the patient's loss of contact with his environment and the diminution of reflex response to stimulation.

Methylethylglutarimide is not a specific barbiturate antagonist but may be considered as a possible antidote. It most likely acts as a reticular stimulant by increasing reticulocortical and reticulospinal activity. The drug reverses the neurologic depression resulting from barbiturate anesthesia and the deep levels of narcosis resulting from barbiturate intoxication. There is one drawback to its use, as with all stimulants—namely, a tendency toward regression to the sleep state. However, when this does occur, patients will respond to command and to superficial stimulation.

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Undergraduate Psychiatric Education

Senior Medical Students Study Patients with the Clinical Team

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THIS PAPER describes a recent change in the instruction of senior medical students at the University of California Medical School, one of the many experiments in undergraduate psychiatric education being carried out throughout the country.¹ A number of definitions of the goals of such instruction have been made. Our statement of goals is as follows.³

"The competences of a graduating senior in psychiatry are those which we all hope a good physician might have at the beginning of his fifth year in medicine. They, therefore, include such grounding in the basic sciences, as applied to human disease and to disorder of functioning, that the young physician is ready to begin to study with his patient the nature of the complexity of external and personal factors that determine the illness, so that it becomes progressively clearer to both.

"To obtain his doctorate in medicine, the student will have learned to obtain the history of a patient's present and past illnesses and to have acquired skills in physical diagnosis, supplemented by clinical observation and the evaluation of special laboratory tests. To attain the competences in psychiatry being discussed, he needs to learn, in addition, the skill of interviewing patients to elicit in detail the minutiae of a personal life experience by practice and precept.

"Under the term *interviewing* is included a fairly well integrated skill to obtain an impression not only of the illness, but also of the person who complains of it. Although this is by now in psychiatric and general medicine circles a truism, nevertheless an effective interview with a patient would: (a) Not obstruct a patient's impulse to tell of his illness fully, and yet would obtain all the essential facts of a complete medical history; (b) help the patient overcome any of his reluctance or anxieties about telling his story as he may; (c) reveal as much of the entire complex of the physiologic disturbance as possible, and also the essential facts of the patient's

• A course in psychiatry for senior medical students, designed to give all members of the class some direct experience, particularly in therapeutic interviewing as well as in total psychiatric study of patients by the clinically integrated work of medical specialists, psychiatric social workers, and clinical psychologists in collaboration with psychotherapeutically trained and experienced psychiatrists is conducted in the following manner: A third of the class, about 25 students, is divided into four sections of six or seven members, and each section attends five hours one forenoon a week for approximately three months. Each student, after an initial demonstration interview by the instructor, sees weekly the same two clinic patients alone, for 45-minute individual interviews, followed by a one and a half hour supervisory session. After this a 50-minute seminar or treatment review conference is followed by a similar period for writing records of interviews and summaries of the therapeutic work. Of four seminars, two are conducted by the psychiatric faculty, and one each by the social worker and the psychologist. Each student reads a written summary of all his interviews with one patient for discussion by his colleagues in the section and by the faculty from all three disciplines.

current life situation, and the chronological relation of the illness to any recent specific changes in it; (d) obtain a sufficiently adequate outline of the patient's total biography to get some impression of the relative balance of ego integration and psychopathology, and to place the current illness in this perspective.

"All this requires that the young physician have a sufficient grasp both of psychodynamics and some basic operational skill in elementary psychotherapeutic procedures. This rudimentary psychotherapeutic skill necessarily includes some degree of objectivity with regard to the phenomena of transference. These competences also imply the ability to discriminate positively in some measure, not merely by exclusion of organic disease, between the psychosomatic reactions and nonneurotic processes; and to estimate the degree of psychopathology with a fair amount of accuracy. They imply, too, some knowledge and skill of referring patients to agen-

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cies best equipped to serve the needs of the individual, or to psychiatric specialists, and how to collaborate with them when necessary."

An opportunity to take another step toward teaching these competences occurred in May of 1956 when the course in psychiatry for senior medical students was revised to fit a new curricular distribution of time. This change gave the students the same amount of time in psychiatry but distributed it over a period of eleven and a half weeks instead of three weeks. At the same time the course, which had been given for 12 years at the Langley Porter Neuropsychiatric Institute, was moved to the Adult Psychiatry Clinic of the University of California Medical Center. This move was suggested because the patients available for study in this setting, more than those seen in an outpatient psychiatric clinic, resemble patients seen in general medical practice.

On the basis of experience in transmitting the skills, referred to before, in postgraduate training,² our course was organized with individual supervision as its base. Thus an important step was the recruitment of faculty. We found many psychiatrists, experienced in psychotherapy, eager to participate in this form of undergraduate teaching, and were able to assemble a faculty of 32 for a section of 26 students. Organization and continuous effort are necessary on the part of the academic faculty to integrate a large clinical faculty. This is partly achieved in our course by a series of meetings during the year with the faculty of each section and a final annual dinner meeting with the faculty for the entire course.

The senior academic year is divided into three periods of eleven and a half weeks. A third of the class, roughly 26 students, is assigned to psychiatry in sections of six or seven for one morning a week. Since the plan is the same for each, a period's work of only one section will be described. The day before the first day of the section work, the students are given mimeographed material and a brief orientation talk concerning the course. We have made a chart to show the organization of the course:

Hour	Week										
8:00	1	2	3	4	5	6	7	8	9	10	11
8:45	Student with Patient No. 1										
9:30	Student with Patient No. 2										
11:00	Student with supervisor										
12:00	Seminars					Treatment Reviews					
12:45	Writing period										

Across the top is the designated space of time for the period and at the left hand side are the times when shifts in activities occur.

Beginning at 8 a.m. on the first day, the student and his supervisor meet for 15 minutes to get acquainted. Then the supervisor introduces the stu-

dent and his first patient and demonstrates to the student over the next 45 minutes his technique of psychiatric interviewing. Following this, supervisor and student have a half hour to discuss the interview. At 9:30 a.m. the same process is repeated with a second patient, followed this time by a 45-minute period between supervisor and student. At 11 a.m., in the first 50-minute seminar, a senior faculty member describes the organization of the course, giving details of the requirements, including attendance at meetings, written work, work with patients and suggested reading. An opportunity is given for the students to ask questions.

A period is set aside for writing following the seminar. Each student is expected to describe in detail and in chronological order what occurred during each interview with his patients. These notes acquaint the student's teacher with what happened during the interview and are useful to the student in furthering his understanding of psychopathology, psychodynamics, therapeutic possibilities in interviewing and in the preparation of his treatment review write-up. They are initialed for completion by the section supervisor before the student leaves each day at 12:45 p.m.

Each day after the first, the morning period is arranged in the following way. The student sees each of his two patients for 45 minutes. At the start of his hour and a half individual supervisory session, he presents his longer notes of the preceding week's interviews to his psychiatrist-supervisor-teacher while he writes a brief note in the patients' clinic charts concerning the interviews just completed. The teacher initials the clinic chart notes and then uses the majority of the time to discuss with the student his work with his patients.

On the second day the students have a seminar with the chairman of the Department of Psychiatry, who presents a hypothetical case encountered in general practice and encourages the students to describe their approaches to a patient with psychological conflicts.

The third seminar is given by a psychologist in the Department of Psychiatry who discusses the role of the clinical psychologist and his contribution to the work with patients. Psychological test materials in common use are demonstrated and discussed. One or two examples of psychological testing are provided, using patients chosen from each daily section, before the student presents his treatment review. The results of the tests are discussed with the individual student and he is encouraged to incorporate the findings into his treatment review presentation.

The fourth seminar is given by a member of the Psychiatric Social Work staff. The social worker's

purpose is to provide the students with a brief survey of the philosophy, scope, training and problems of the profession of social work and a beginning knowledge of and experience with community resources and social services.

From this point, the seminars take the form of treatment reviews in which each student is given opportunity to present to his colleagues and members of the faculty his work with one of his patients. He reads a written summary divided into three parts: introductory paragraph, patient's biography and an account of his work with the patient. He is encouraged to present his data in a period no longer than 30 minutes so that the remaining 20 minutes can be used for discussion. The supervisor of the student making the presentation, in addition to other faculty, attends the review. Participation of all students is encouraged by the faculty member who is chairman. In this way the students' learning is broadened by hearing of the work with other patients, and the faculty members have an opportunity to teach and keep abreast of the progress of the work.

Over half of the patients dealt with are referred from within the University Medical Center as a part of their total medical treatment; the rest from the community. About a third come as self-referrals, while another third are referred following psychiatric evaluation in the Adult Psychiatry Clinic. The students themselves refer a few patients from those they treat in the Medical Clinic. We charge a fee scaled to the patient's ability to pay and we accept only patients we consider unable to afford private psychiatric treatment or for whom private treatment is not feasible. Some patients who can afford private medical care are unable to afford psychiatric treatment. Because of this in some instances the students work in collaboration with private physicians in treating their patients.

An attempt is made to have at least one family problem involving an adolescent or preadolescent in each section so that some aspects of child psychiatry might be brought to the attention of the students. No children are accepted who might need playroom therapy, for such facilities are not available.

In the first interview and study of each patient referred to the course, the social worker attempts to formulate with the patient the psychological problems for which he wishes help and to consider with him some of the interrelations of the social, environmental and financial factors of his situation. The manner in which work in the program proceeds, including the fact that his therapist will be a senior medical student working under psychiatric supervision, is explained. A fee for the interviews is set. Groundwork is laid for whatever cooperative work

may be indicated with community social agencies. A general agreement is reached with the patient as to what he hopes to gain from the work and what will be expected of him. The goal of the study is to offer the patient an experience in a therapeutic relationship which will nurture his motivation for emotional maturation.

As the person through whom the patients maintain a continuing relationship with our staff, and as the course's link with the community, the social worker is offered daily points of contact with the students in their work. These contacts he attempts to utilize to further their learning of a method of helping patients with emotional problems. The social worker's contribution is woven into the work by chart notes, individual contacts with students and patients, brief participations in student-supervisor conferences and regular attendance at treatment review sessions.

Our experience in the course has been too short to permit conclusions as to its effectiveness with patients and students. Thus far we have observed some changes in teachers, students and patients. Teachers have gradually taken more responsibility by more frequently assuming the chairmanship of the meetings at which students present their reviews of treatment. Some teachers have indicated a decrease in the serious doubts that they had about student effectiveness in working with patients with certain kinds of clinical syndromes. Students have stated both spontaneously and upon being questioned that they benefited from their experience. They do not seem so puzzled about the work of psychiatrists and seem somewhat clearer about the nature and possibilities of psychotherapy.

Our patients have kept 85 per cent of appointments that were possible for them to keep and have tended gradually to remain longer in treatment with the students. Over 20 per cent of the patients remained in treatment for all three periods during the second year of the course as compared with 15 per cent the first year. In all three years we have noted a slight increase in the proportion of new patients remaining for the entire first period, ranging from about 77 per cent in the first year to 85 per cent in the third. (Two factors that must be considered in this are some increase in the selectivity of patients accepted for treatment and a smaller group of new patients each year.) The median number of interviews for which the students saw their patients increased from nine in our first year to 12 in our second.

We have heard of a good deal of progress in the situations of some of our patients. One profoundly disturbed man who had spent long periods in a state hospital has returned to work; other patients have been referred to private physicians after improve-

ment in their income, and still others have improved their grades in school. We have also noted improvement of physical symptoms—relief of anemia in one case. In other cases a diagnosis of organic disease was made, with consequent referral of the patients to other clinics for appropriate treatment. We have not yet heard of suicide or homicide by any of the patients assigned to the students.

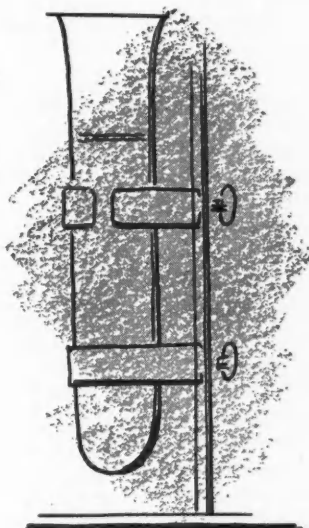
We are not under any illusions that the students have learned the technique of therapeutic interviewing. We also realize that so short a time does not permit any resolution of the students' countertransference problems. We do feel, however, that the

majority of students have taken a few steps toward the goals mentioned at the beginning of this paper.

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Thioridazine (Mellaril®) in Psychiatric Patients

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THIORIDAZINE (Mellaril®) is a new phenothiazine tranquilizer of the piperidine type. In comparison with phenothiazine derivatives currently in use, its chemical structure most resembles that of mepazine. However, there are two important differences (Figure 1). First, the piperidine ring is linked to the phenothiazine nucleus by an ethyl, rather than a methyl, group. Second, the phenothiazine ring is substituted at the 2-position with a thiomethyl group, rather than being unsubstituted.

Pharmacologic studies indicate that, in common with other phenothiazines, thioridazine has weak anticholinergic and antihistamine effects, moderate adrenolytic and spasmolytic effects and some degree of antagonism to serotonin.¹⁰ Of greater clinical interest is that the drug also produces manifest sedation, potentiation of anesthesia and inhibition of amphetamine toxicity—all properties common to “tranquilizing agents.” In two respects, thioridazine differs somewhat from other phenothiazine tranquilizers. Rats conditioned against electric shock by an auditory stimulus show no alteration of the flight reaction under treatment with the drug. However, a manifest sign of nervous tension (defecation) is reduced without inhibition of the defensive reflex. Drug-induced “catalepsy” (maintenance of abnormal positions) is not produced by thioridazine as it is by other phenothiazines. This phenomenon may be related to drug-induced extrapyramidal effects, which are conspicuously absent with thioridazine.

As yet, few clinical studies of the drug have been reported. A double-blind controlled study of psychiatric out-patients indicated improvement in 12 of 15 patients treated with the drug. This response was significantly better than was obtained from a less active phenothiazine or with placebos for each of these drugs. The dosage used was modest, not exceeding 75 mg. daily, and side-effects were minimal.³ Good therapeutic results were obtained in another study involving almost 200 patients with psychotic and functional disorders. Despite a wide range of dosage, no extrapyramidal effects, agranulocytosis or jaundice were observed.⁸ A small study of 29 patients indicated that the drug was effective in a number of psychiatric disorders, including

• Thioridazine (Mellaril®) was given to 104 psychiatric patients with a variety of illnesses, chiefly schizophrenic reactions. Of 14 patients treated in a double-blind study with successive one-month courses of drug or placebo, nine improved most on the drug and only one on placebo. These results, although limited, confirm a definite therapeutic action for this compound.

Nine of 24 patients were significantly improved after treatment with thioridazine for an average of four months following previous treatment with other phenothiazine tranquilizers. Of ten patients treated intensively with thioridazine after they had not responded to other phenothiazine drugs, two were definitely improved and three were slightly improved. Twenty-eight of 56 patients treated from the outset with thioridazine were significantly improved after an average of six months. Most patients received from 100 to 400 mg. daily. These results were comparable to those obtained from other potent phenothiazine tranquilizers. The drug is particularly advantageous for a group of schizophrenic patients who are sometimes made worse by other phenothiazine derivatives or rauwolfia alkaloids. It should also be suitable for treating patients with psychoneuroses and chronic brain syndromes.

Only minimal side reactions were observed, chiefly drowsiness, dizziness and nasal stuffiness. Weight gain occurred frequently during treatment.

schizophrenic reactions and psychotic depressions. Only drowsiness and dizziness were observed as side reactions.¹

METHOD OF STUDY

The present study included three groups of patients who were confined for treatment in a Veterans Administration hospital. The first was treated with either thioridazine or a placebo alternately for a brief period. The second group was treated with the drug after having previously received other phenothiazine tranquilizers (usually chlorpromazine or prochlorperazine). The third group of patients was treated only with thioridazine.

Fourteen patients were treated in a double-blind study. Each patient was issued either a bottle of placebos or of 50 mg. thioridazine tablets, whether the one or the other being known only to the pharmacist. The patient's physician was free to prescribe up to six of the tablets daily. After a month of

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TABLE 1.—Results of Double-Blind Studies of Thioridazine in 14 Patients

Diagnoses	Improved on Drug	Improved on Placebo	Improved on Both	Unimproved on Either
Schizophrenic reaction.....	5	1	3	1
Psychoneurosis.....	1	0	0	0
Personality disorder.....	1	0	0	0
Affective disorder.....	1	0	0	0
Chronic brain syndrome, various types.....	1	0	0	0
Total.....	9	1	3	1

treatment with the tablets first issued, tablets of the alternate kind were provided for each patient and were used for another month. Patients were evaluated at the beginning of the trial and at the end of the first and second months of treatment. Evaluation was made by psychiatric interview, by consultation with ward personnel and the completion of a Multidimensional Scale for Rating Psychiatric Patients.⁹

Thirty-four patients previously treated with other phenothiazine drugs and 56 patients treated initially with thioridazine were chosen from a variety of nosologic categories, although most were chronic schizophrenics. All but one were men. Ages ranged from 18 to 72 years, the median being 36 years. The duration of illness varied between three months and 40 years. Only seven patients had been ill for less than a year, while 38 had been ill for more than ten years. The dose of thioridazine used in these patients was flexible, varying from 50 to 2,000 mg. daily.* The majority of patients received from 100 to 400 mg. daily, though 17 patients never received more than 75 mg. daily and only 24 received more than 400 mg. daily. Treatment lasted from a minimum of two months to a maximum of ten months, the majority of patients having been treated for six months.

Evaluation of these patients was made on the basis of the ward psychiatrist's clinical opinion of change, consultation with ward nursing personnel, an independent psychiatrist's evaluation and completion of either the Multidimensional Scale or an abbreviated Hospital Adjustment Scale.² From all these sources of information a comprehensive rating was made of *decided*, *moderate* or *slight* improvement or *unimproved* or *worse*. An effort was made to maintain some internal consistency with the evaluation of previous drug studies at our hospital.^{5,6,7} A rating of *slight* improvement implied little more than partial sedation of the patient and quieter ward behavior. *Moderate* improvement indicated either behavioral improvement which permitted the patient to participate in activities programs or psychotherapy, or social improvement which permitted the granting of ground privileges or passes from the

hospital. It was also based on increased ability to create interpersonal relationships, lessening of bizarre thinking, and evidence of some insight. *Decided* improvement meant that the patient had changed greatly according to the above criteria and was being considered for release from the hospital. As with previous studies, only moderate or decided improvement was considered significant as a therapeutic effect attributable to the drug, not likely to occur spontaneously.

RESULTS

The results of the double-blind study are shown in Table 1. Four outcomes were possible: Improvement while receiving either the drug or the placebo, improvement from both, or lack of improvement from either. Nine patients improved while receiving the drug, one while receiving placebo, three equally from each, and one was unchanged during either treatment. Although small, this study demonstrated a definite therapeutic effect from the drug.

The results of treatment of 24 patients with thioridazine following other phenothiazines are shown in Table 2. Only nine of these patients improved significantly with the additional treatment. Three of the five rated as "unchanged or worse" were worse. In most cases the dose of drug used was comparable milligram for milligram with chlorpromazine. It should be noted that in some of these cases the first tranquilizing agent had not been used for optimal duration before the switch was made to thioridazine. However, in some cases patients definitely improved on thioridazine after having been refractory to the previous treatment.

Ten additional patients were treated intensively with thioridazine after long-term unsuccessful treatment with chlorpromazine or other phenothiazine tranquilizers. The majority of these patients had been treated with from 600 to 900 mg. of chlorpromazine daily for protracted periods with inadequate improvement. With no interruption of treatment, these patients were switched to thioridazine in initial doses of 100 mg. three times daily, which were rapidly built up so that at the end of 10 to 14 days a peak dosage of 1,600 mg. daily was achieved. This level of dosage was maintained for a minimum

*The limitation of six tablets daily applied only to the group in the previously mentioned double-blind study.

TABLE 2.—Results of Treatment of 24 Psychiatric Patients with Thioridazine Following Other Phenothiazine Tranquillizers

Diagnoses	Results				Total
	Decided Improvement	Moderate Improvement	Slight Improvement	Unchanged or Worse	
Schizophrenic reaction.....	2	6	9	4	21
Chronic brain syndrome, various types.....	0	0	1	0	1
Mental deficiency.....	0	1	0	1	2
Total.....	2	7	10	5	24

TABLE 3.—Results of Treatment of 56 Psychiatric Patients with Thioridazine

Diagnoses	Results				Total
	Decided Improvement	Moderate Improvement	Slight Improvement	Unchanged or Worse	
Schizophrenic reaction.....	6	12	13	4	35
Chronic brain syndrome, various types.....	2	3	5	4	14
Psychoneuroses.....	0	3	1	0	4
Affective disorders.....	0	2	0	1	3
Total.....	8	20	19	9	56

of three weeks, and the dosage then was gradually reduced if reduction was indicated. Of the ten patients treated in this manner, two showed significant improvement which exceeded that obtained from any previous treatment program, while three others were slightly improved. All patients tolerated the intensive treatment program well without evidence of orthostatic hypotension, excessive somnolence, seizures or the extrapyramidal syndromes. During this period of intensive treatment, urine specimens were obtained for qualitative measurement of the excretion of the drug, using the acid-ferric chloride test.⁴ At peak dosage levels most patients showed constant elimination of the drug in the urine, suggesting that a state of saturation had been obtained. However, no linear relationship between positivity of the urine test and dose of drug was obtained.

The results of treatment of 56 patients with thioridazine without previous phenothiazine treatment are shown in Table 3. Twenty-eight of these patients were significantly improved. Considering the chronicity of disease in most of these patients, these results are considered comparable to those expected in our patients from other potent therapeutic agents. No definite correlation could be made between dose and the result obtained, again emphasizing the fact that the dose must be fitted to each patient. Sixteen of these patients left the hospital subsequent to this treatment.

Twelve patients who had been chronically treated with doses of 200 to 500 mg. daily of thioridazine were given acute single doses of 500 mg. of the drug in addition to their usual dose. Measures of blood pressure were obtained at half-hour intervals over a 6-hour period, both in the sitting and standing position. Electroencephalographic tracings were run on ten patients before and 4 hours after this dose. All 12 patients had drowsiness, ranging from slight

to moderate in degree. During the peak effect several of the patients slept lightly but could be easily aroused. The majority had nasal stuffiness. Other clinical effects noted were flushing of the skin or conjunctival injection and dry mouth. Blood pressure fell in four patients, the fall not exceeding 30 mm. systolic or 10 mm. diastolic in either position. One patient had a mild syncopal reaction in the standing position during the peak of the drug effect. In this case the electroencephalogram changed from a normal pattern to one with paroxysmal focal bursts of slow waves (Figure 2). Electroencephalographic abnormalities were also noted in several of the other patients. Similar electroencephalographic changes have been noted by us previously in patients treated for long periods with doses of chlorpromazine or reserpine.

Side reactions were minor and infrequent. Some patients complained of drowsiness or dizziness, but in neither instance were the complaints severe. No postural hypotension was observed in patients treated with the usually small initial doses in this study. At large doses, minor degrees of nasal congestion were evident, although less than from equivalent doses of chlorpromazine. No allergic reactions of any kind were observed. Complete blood cell counts were done before and at weekly intervals during the first 12 weeks of dosage. In two instances the absolute neutrophil counts dropped below our arbitrary limit of 1,800 per cu. ml. and the drug was discontinued. In both cases subsequent observation indicated a periodic neutropenia completely unrelated to drug administration. No cases of clinical jaundice occurred. Adverse central or autonomic nervous system effects were conspicuously absent. No extrapyramidal effects or seizures were observed despite a dose range which should have produced these effects in some patients. Excitement (aka-

thisia) was also absent as a drug effect, leading one clinician to observe that "at least the drug doesn't make patients worse if it doesn't make them better."

Weight gain was observed in 42 of 59 patients whose weight was observed. The mean gain was 9.5 pounds. Only four patients lost weight while receiving the drug. Correlation between weight gain and clinical improvement was not especially high.

DISCUSSION

Thioridazine is an active therapeutic agent. The results with this drug approximate our current experience with other phenothiazine tranquilizers. It is effective in a variety of psychiatric disorders, including schizophrenic reactions.

The clinical effects of thioridazine differ from those of other phenothiazines. As with mepazine, clinical sedation is less than that from chlorpromazine at equal doses. In many clinical situations some degree of sedation is desirable, in which case chlorpromazine or like drugs may be preferred. At the same time, thioridazine has none of the "stimulating" effects of some of the piperazine derivatives of phenothiazine such as prochlorperazine, perphenazine, thiopropazate and trifluoperazine. Some patients, particularly retarded, inert schizophrenics, may benefit from this action, but for others the restlessness and excitement can only be regarded as unpleasant and possibly harmful. The absence of extrapyramidal reactions from thioridazine, in which the drug differs even from mepazine, is an advantage. The contention, now fading, that such effects are essential for therapeutic activity in schizophrenics is not supported by the present study. Indeed, most clinicians would willingly give up the extrapyramidal syndromes, which are bothersome to the patient, limit the extent of therapy or require supplementary drug treatment.

The type of schizophrenic patient most likely to benefit from thioridazine is neither the acutely disturbed patient (who does better with a drug with more sedative properties) nor the chronic "wall-flower," who may benefit more from the "stimulating" phenothiazines. The schizophrenic who responds best to thioridazine is one with relatively mild psychosis, with symptoms of anxiety and somatic complaints, and with retention of insight. Such patients are frequently made worse by treatment with other phenothiazine drugs or rauwolfia alkaloids. In these patients the specific tranquilizing

effect of thioridazine may control symptoms while permitting benefit from other treatment measures.

Despite the unimpressive results from treating patients with anxiety reactions and chronic brain syndromes in this study, we believe that thioridazine may have much to offer in such cases. In the present study the patients in these categories were especially difficult, our judgments about changes especially guarded, and our dosage generally quite conservative. In different circumstances the results might have been much better. The particular type of tranquilizing effect of this drug as well as the absence of severe central or autonomic nervous system side reactions should make it highly suitable for such patients.

One is always hesitant to proclaim that any new agent does not produce certain complications, especially on the basis of limited experience with it. In regard to jaundice and agranulocytosis, we believe all phenothiazine derivatives still must be considered suspect. The frequency of these complications varies widely among drugs of this type and is often so rare as to be almost negligible. Thioridazine may very well prove to be in the latter category.

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Acute and Chronic Asthma

Treatment with Theophylline in Hydro-Alcoholic Solution: Clinical Evaluation and Pulmonary Function Studies

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THEOPHYLLINE IS OF GREAT VALUE in relaxing the bronchospasm of asthma. Waxler and Schack⁵ showed that in acute cases the effective blood level was 6 micrograms or more per milliliter. In order to obtain this level rapidly, they noted, it was necessary to give 250 mg. of aminophylline intravenously. When aminophylline was taken by mouth in the usual tablet form, the theophylline level in the blood a half hour after ingestion was only 2 mcg. per milliliter.

To avoid the difficulty of intravenous administration, advantage may be taken of the observation by Schluger, McGinn and Hennessy³ that theophylline in an alcohol-water solution is rapidly absorbed from the intestinal tract.* The preparation they studied, Elixophyllin, contains in each 15 cc. (one tablespoon) 80 mg. of theophylline, which is equivalent to 100 mg. of aminophylline. In addition, each 15 cc. contains 3 cc. of ethyl alcohol, and flavoring agents.

Seventy-five cubic centimeters of Elixophyllin (400 mg. theophylline) taken by mouth was followed by mean theophylline blood levels of 8.0 mcg. per milliliter in 15 minutes, 10.3 mcg. per milliliter in 30 minutes and 11.0 mcg. per milliliter in one hour. In contrast, ingestion of 500 mg. of aminophylline in tablet form resulted in theophylline levels of 1.1, 3.8, and 7.2 mcg. per milliliter in 15, 30 and 60 minutes, respectively. Increasing the dose of aminophylline tablets usually caused gastric distress.

Because of the potential usefulness of a rapidly acting bronchodilator that can be taken by mouth, a study of the use of Elixophyllin in two groups of patients, one with acute asthma and the other with chronic asthma, was carried out.

ACUTE ASTHMA

Materials and Methods

Thirty-five patients, 13 to 74 years of age, who came either to the Los Angeles County General Hospital or to the author's office cooperated in this part

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*The preparation they studied was Elixophyllin, a product of Sherman Laboratories, whose support made this study possible.

• A flavored solution containing 80 mg. of theophylline and 3 cc. of ethyl alcohol per 15 cc. was given orally to 31 patients with acute asthma to terminate the attack. Thirty patients with moderate to severe chronic asthma were alternated for three or four weeks on daily multiple doses of either the theophylline solution or a placebo.

In the acute cases three-second Vital Capacity increased by 33.8 per cent and Maximal Breathing Capacity by 30.2 per cent in one hour after taking 60 cc. of the theophylline solution. When placebos were given, both measures of lung function declined during the first half hour.

Seventy-one and a half per cent of patients with acute cases felt moderate to complete relief of symptoms. In persons with chronic asthma the regular use of the theophylline solution did not change the frequency of asthma in most cases, but it decreased the severity in 59 per cent of cases. The values for three-second Vital Capacity and Maximal Breathing Capacity rose only a little.

Gastric irritation was noted in one-third of the chronic cases and one-fourth of the acute cases. This could be reduced by appropriate measures.

of the study. Patients who were in severe status asthmaticus with dehydration, or who had obvious signs of infection, or who had been given aminophylline within two hours were excluded. In the group selected there were 15 males and 20 females, all of whom had had moderately severe to severe asthma for at least two years. The majority were between 40 and 60 years of age.

As soon as the patient had been examined and found acceptable for the study, tracings were made of the 3-second vital capacity (timed vital capacity or T.V.C.) and the 15-second maximal breathing capacity (M.B.C.), using either a Stead-Wells or Collins 13-liter recording respirometer. Each patient was then given either Elixophyllin or a placebo. Men were given 75 cc.; women and older children received 60 cc. The placebo used was flavored to resemble the base of Elixophyllin, and contained 3.5 mg. of quinine hydrochloride per 15 cc., to equal the bitter taste of theophylline. The amount of quinine was only a small fraction of the least medicinal dose. The placebo in this part of the study also contained 20 per cent ethyl alcohol.

At the beginning of the study alternate patients were given Elixophyllin and placebos. If the patient's condition did not improve in a half hour after the placebo, he was given an equal amount of Elixophyllin. As the first ten controls showed no improvement or got rapidly worse in the half hour after the placebo was given, it did not seem worth while continuing the placebo test in acute cases. The alcohol content and the factor of suggestion appeared to have no effect.

Pulmonary function readings were taken 15 minutes, 30 minutes, one hour, two hours (and in some cases three to six hours) after the single dose of Elixophyllin and at 15 and 30 minutes after the placebo. Several days later, when the patient had returned to his usual condition, another set of readings was taken.

The actual readings for T.V.C. and M.B.C. were converted to "per cent of expected normal" for each patient, using the formulae of West⁶ and Motley.²

Results

Relief was judged as *complete* if symptoms had cleared in one hour, *pronounced* if no further treatment was needed but some wheezing persisted, *moderate* if air hunger was relieved but epinephrine was needed for residual wheeze and cough, and *slight* if the patient felt a little better and had a measurable increase in lung function.

Results in terms of degree of relief are shown in Table 1. Complete relief was the exception. About one third of the patients were relieved to the extent that no other medication was needed for the moment, and another one third required only a small amount of supplemental medication. The remaining third of the group received little or no benefit. The patients given placebo showed no improvement in symptoms or measurable lung function.

The average values for T.V.C. and M.B.C. at intervals of 15, 30, 60 and 120 minutes after Elixophyllin are plotted in Chart 1. The initial values of each function were low for the group as a whole—only 37.7 per cent and 29.5 per cent, respectively, of expected normal. As a matter of interest the curve of blood theophylline after 75 cc. of Elixophyllin, as determined by Schluger, McGinn and Hennessy,² was included in the graph on a separate scale. The parallel between the theophylline level and the change in average lung function was striking. This depression of lung function was consistent with the severe symptoms present. Table 2 gives the values from which Chart 1 was drawn.

On the average, improvement was noticeable within 15 minutes and reached its peak in around one hour. Subsequently, the average improvement declined, although not in all cases were readings lower at two hours than at one hour.

TABLE 1.—Relief of Acute Asthma in 35 Patients Treated with Elixophyllin and Placebo

Degree of Relief*	Elixophyllin		Placebo	
	No. Cases	Per Cent	No. Cases	Per Cent
Complete	2	5.7	....	....
Pronounced	11	31.5	....	....
Moderate	12	34.3	....	....
Slight	8	22.8	....	....
None	2	5.7	10	100†

*Criteria given in text.

†Only ten patients given placebos.

TABLE 2.—Timed Vital Capacity and Maximal Breathing Capacity (Average Values) as Per Cent of Predicted Normal in 35 Patients with Acute Asthma Treated with Elixophyllin

Time After Drug Given	Per Cent of Predicted Normal	
	3-Sec. T.V.C.	M.B.C.
0	37.7	29.5
15 min.	41.3	32.0
30 min.	47.0	35.8
1 hr.	50.4	38.4
2 hr.	47.1	35.5
After recovery	64.4	55.5

The values for T.V.C. and M.B.C. taken after recovery from the acute attack show that there is constantly present in these cases a large measure of impairment in lung function.

Although not apparent from the average figures, ten patients (29 per cent) showed slightly poorer function at 15 minutes after Elixophyllin than before taking it, and five (14 per cent) were still slightly below initial reading at 30 minutes. All these patients had responded by the end of an hour. Differences in rate of absorption may account for the slow response. But it could also be explained by assuming that factors other than bronchospasm are causing part of the obstruction to air flow.

The per cent of change of the T.V.C. and M.B.C. after Elixophyllin is given in Table 3. These values (for T.V.C.) compare well with the improvement after Elixophyllin noted by Spielman.⁴ In his series of 20 patients with acute asthma, vital capacity increased 39 per cent.

The most prominent complaint about Elixophyllin in the acute cases was burning in the stomach with or without some nausea. Nine, or about twenty-five per cent, of the patients mentioned this. Only one patient actually vomited, and was excluded from this series. Feeling light-headed or dizzy was a frequent but minor complaint, made only by women patients. Two women went through a weeping spell shortly after taking 60 cc. of Elixophyllin, but soon calmed down.

The data presented in this section suggest that on the average Elixophyllin relieves bronchospasm and increases pulmonary function in patients who are having acute exacerbations of asthma. After a single

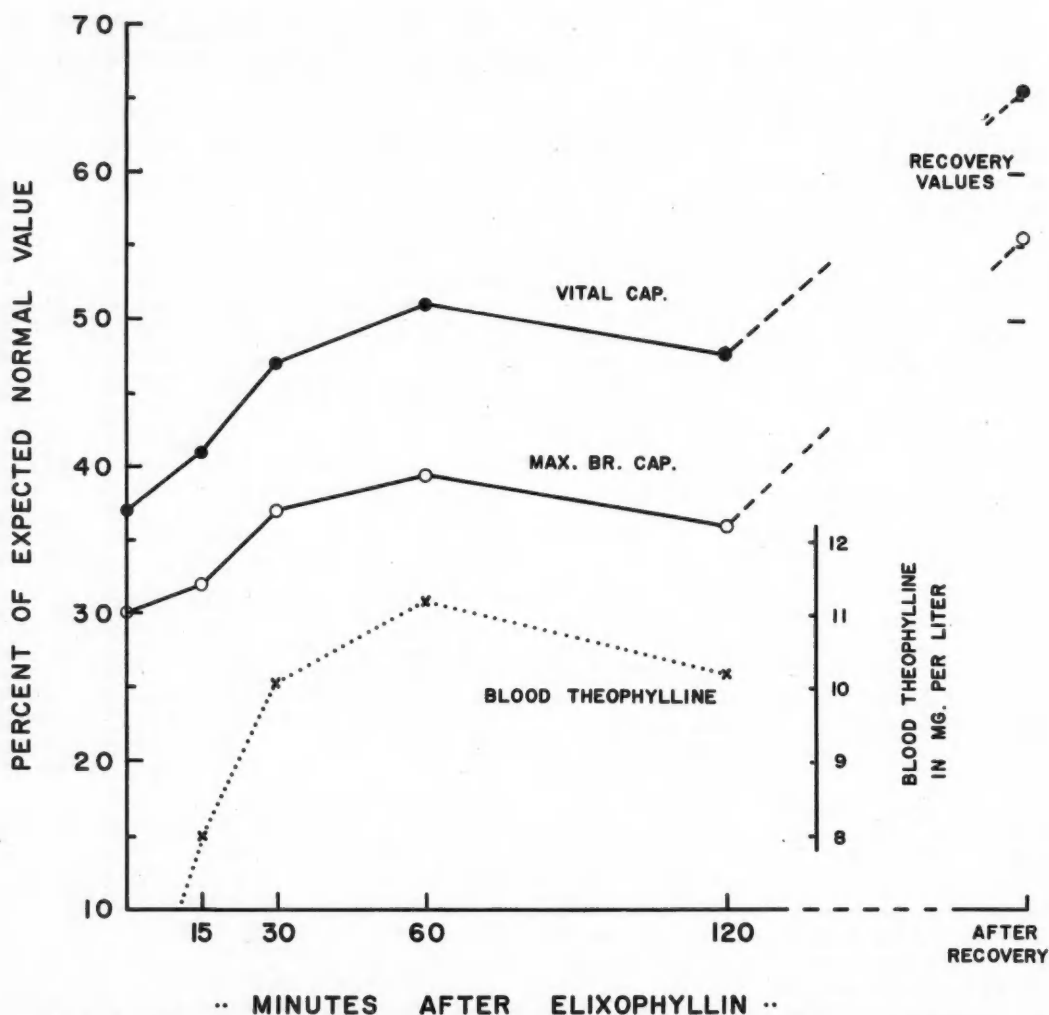


Chart 1.—Effect of Elixophyllin on 3-second Vital Capacity and Maximal Breathing Capacity of patients who received the drug during acute phase of bronchial asthma. The dotted line at bottom of chart shows the theophylline content in the blood after administration of 75 cc. of Elixophyllin (400 mg. theophylline), as determined by Schluger, McGinn and Hennessy.³

dose of 75 cc. (400 mg. theophylline) improvement was noted on the average within 15 minutes, continued up to one hour, and then tended to decline.

Nearly all the patients studied had some decrease in lung function even between attacks. Since single doses of Elixophyllin usually did not raise lung function to the resting level and tended to lose their effectiveness after two hours, the dose may be repeated at intervals to maintain maximum benefit. As individuals vary widely, the need for extra Elixophyllin should be judged by the patient's response. Allowance should also be made for the fact that about one third of patients may not respond in the first 15 minutes after taking Elixophyllin.

TABLE 3.—Change from Initial Values of Timed Vital Capacity and Maximal Breathing Capacity in Cases of Acute Asthma

Treatment	Timed Vital Capacity		Maximal Breathing Capacity	
	Per Cent Change		Per Cent Change	
After Placebo, 10 cases.....	15 min.—	0.5	—	4.5
	30 min.—	10.1	—	8.5
After Elixophyllin, 35 cases.....	15 min.+	9.6	+	8.5
	30 min.+	24.6	+	21.4
	1 hr.+	33.8	+	30.2
	2 hr.+	25.0	+	20.4

CHRONIC ASTHMA

Materials and Methods

Thirty-six patients with chronic asthma were selected from clinic and private patients to take Elixophyllin and a placebo for three to four weeks each. Six patients had to be dropped from the study because of side effects from Elixophyllin. Of the 30 remaining patients, 14 were males and 16 females. The youngest was 4 years of age, the oldest 74, and the median for the group was 50 years. The average duration of asthma was seven years, although many of the patients had had the disease their life long. Seven of the thirty patients were classed as having moderate asthma, as they were prevented from working and used daily medication. Twenty-three had severe asthma and required frequent emergency treatment.

The dose of both Elixophyllin and placebo was 60 cc. (4 tablespoons) four times a day for adult males, and 45 cc. (3 tablespoons) for women and adolescents—320 mg. and 240 mg. of theophylline, respectively. These amounts were often decreased slightly by the patients themselves, depending on the amount of relief experienced.

Each patient kept a daily record of asthmatic attacks, coughing spells, supplemental medication and an estimate of over-all improvement in symptoms or lack of improvement. (After a short period of trial, patients are able to keep records that are more reliable than memory.¹) These data were checked each week, and the number of attacks of asthma and/or coughing per week was designated the Symptom Index. The degree of relief was rated from none (0) to complete (4). Thus complete control of asthma for a week would make the Symptom Index zero, and conversely the degree of relief would be 4.0. The more the symptoms the greater the Symptom Index, and less than complete relief would result in some value between 0 and 4.0.

During the control period, and once a week during the treatment period each patient was checked for T.V.C. and M.B.C. The measurements were taken at mid-morning, after the patient had been sitting quietly for a half hour. Readings were taken with the patient standing. The values obtained were converted to per cent of expected normal in each case.

Results

As shown in Table 4, lung function improved modestly in the group as a whole during the time Elixophyllin was being taken regularly. Before treatment the average value for T.V.C. was 49.7 per cent of normal; during the month of Elixophyllin administration it rose to 58.5, an increase of about 15 per cent. The placebo caused no change on the average from the initial value.

TABLE 4.—Average Values Before and During Treatment with Elixophyllin and Placebo Among Thirty Patients with Chronic Asthma.

	Initial Value	Under Elixophyllin Therapy	With Placebo
Timed Vital Capacity (Per cent of normal)	49.7	58.5	49.9
Maximum Breathing Capacity (Per cent of normal)	35.6	42.9	33.5
Symptom Index (Weekly Average)	23.9	19.5	22.7
Degree of Relief* (Weekly Average) .....	....	2.38	1.08

*No relief 0; complete relief 4.0.

The other function measured, M.B.C., rose from 35.6 per cent to 42.9 per cent of predicted normal during the use of Elixophyllin, an increase of 20 per cent. Again the placebo produced no change on the average from the initial readings.

The Symptom Index, which is primarily a measure of the frequency of asthmatic attacks, showed only a slight decrease during Elixophyllin therapy. The difference in the Degree of Relief Index, however, was large; it was twice as much during Elixophyllin as during placebo administration. This was borne out by typical comments from patients, such as: "much lighter attacks"; "can bring up mucus"; "easier to stop attacks," etc. This would indicate that Elixophyllin used on a regular schedule decreased the severity of asthma in this group, without altering the basic pattern of the attacks.

Although only one of the 30 patients was completely relieved of asthma by Elixophyllin, 18 noted substantial benefit. The placebo was associated with slight to moderate relief in two patients, a rather lower incidence of placebo effect than was expected, which may indicate that in this type of severe intrinsic asthma psychologic factors are less important than organic factors.

The outstanding complaint regarding Elixophyllin was nausea, and some patients noted gastric irritation. These phenomena were most pronounced when the solution was taken on an empty stomach, and they varied with the amount taken. Six adult patients originally scheduled for this study were unable to continue; five because of nausea with or without cramps and diarrhea, or nausea and increase in asthma, and one because of increase in bronchospasm with each dose of Elixophyllin.

The side effects noted are listed in Table 5. During the full initial dose of Elixophyllin, a total of ten patients complained of some degree of gastric disturbance, but they were willing to continue because of the effect on their asthma. Gastric distress became less of a problem if Elixophyllin was taken when some food was present in the stomach, and as the dose was decreased after the test period.

An itching erythematous rash on the neck, back, chest and upper arms appeared in one patient during the third week of Elixophyllin therapy. It cleared when Elixophyllin was replaced by the placebo, and reappeared when the drug was tried again.

The placebo was associated with nausea in one patient and with an increase in asthma in another.

DISCUSSION

The study presented here indicates that a hydro-alcoholic solution of theophylline when taken by mouth in adequate doses brings about an increase in pulmonary function in asthma. In acute attacks the effect is usually noticeable in 15 minutes and increases for an hour. Response is not this rapid in all cases, indicating that there may be different rates of absorption, or that factors other than bronchospasm are important. Patients who do respond well to Elixophyllin (37 per cent of the patients with acute cases in the present series) may be spared the inconvenience of intravenous aminophylline in many of their attacks, and can assume more responsibility for their own treatment. Those who do not respond readily will require intravenous aminophylline or hospital treatment.

Spielman⁴ in reporting on 20 cases of acute asthma found that all of them noted good to excellent relief of symptoms after 75 cc. of Elixophyllin. In the present series of 35 cases of acute asthma, ten obtained practically no relief. The difference may be explained by the fact that the patients in Spielman's study had less initial depression of lung function and were better able to respond to the bronchodilator.

In chronic asthma the routine use of Elixophyllin decreases the severity of bronchospasm but does not alter the basic pattern of the disease except in a very few cases. In this respect it has the same effect as other forms of theophylline. Gastric distress with

TABLE 5.—Side Effects Complained of by Thirty Asthmatic Patients Receiving Elixophyllin and Placebos

Side Effect	Elixophyllin No. of Cases	Placebo No. of Cases
Nausea		
Mild	3	0
Moderate	4	1
Severe	2	0
Vomiting	2	0
Cramps	1	0
Diarrhea	1	0
Insomnia	1	0
Headache	1	0
Rash	1	0
Asthma	0	1

continuous use was complained of by a third of the patients, but this tended to disappear when the dose was reduced or if taken along with some food.

Elixophyllin appears from this study to be a useful preparation for the control of bronchospasm in asthma. As with other methods of treatment, its use must be adjusted to the individual patient's needs, as dictated by experienced and clinical judgment.

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Psoas Abscess Following Acute Appendicitis

CHARLES S. KIPEN, M.D., and
EUGENE B. LEVIN, M.D., Los Angeles

THE MORE COMMON SITES of abscess complicating perforated appendicitis are well known. However, standard textbooks of surgery and the literature make only infrequent mention of retroperitoneal infections,⁶ and reports of actual psoas abscess following appendicitis are quite rare.

In 1886, Reginald Fitz³ briefly stated that "the course of the psoas and iliacus may be followed into the thigh. . . ." In 1905, Kelly,⁴ in his discussion of retroperitoneal abscess, mentioned a case reported by Crile in which "the abscess extended from the right iliac fossa down the inner aspect of the thigh to the popliteal fossa." Deaver¹ in 1914 stated that sometimes retroperitoneal abscesses ". . . may present themselves beneath Poupart's ligaments. . . ."

More specifically, McCorkle and Stevenson⁵ in 1938 reported a case in which, following drainage of a psoas abscess in the right thigh, subsequent laparotomy revealed an appendix whose tip had perforated and was adherent to the psoas sheath. Devine,² in 1946, reported a similar case, and Pierleoni and Johnson,⁷ in 1955, reported two cases of rupture of the appendix into the psoas sheath.

The following case is reported in order to emphasize more specifically psoas abscess as a possible complication of appendicitis.

REPORT OF A CASE

A 19-year-old boy was admitted to the Midway Hospital, Los Angeles, on July 29, 1957, with chief complaint of difficulty in walking and pain in the right anterior thigh of about five days' duration. He had been examined four months previously because of intermittent mild discomfort in the right lower quadrant of the abdomen. Findings at that time and again a month later were entirely nonrevealing. Six weeks previous to admission he had been re-examined because of increasing pallor and a loss of 40 pounds in body weight, although he said

that otherwise he felt well. Examination was again nonrevealing except for a leukocytosis of 14,200 per cubic millimeter, with no abnormality in the cell differential. Hemoglobin content was within normal limits.

On admission to the hospital the patient appeared flushed and "toxic." The temperature was 102° F., the pulse rate ranged between 80 and 110 and the blood pressure 130/80 mm. of mercury. Mild tenderness to percussion was present in the right costovertebral area. There was decided scoliosis of the lumbar spine to the left. The right thigh was flexed about 30° and could not be fully extended, causing the patient to walk with a pronounced limp. A large mass was palpated in the abdomen, occupying almost the entire right lower quadrant and extending medially to the midline, superiorly almost to the right hypochondrium and laterally to the anterior superior iliac spine. This mass was nonmovable and only slightly tender. Rectal examination elicited only a sense of fullness on the right side.

Erythrocytes numbered 4.05 million per cu. mm. and the hemoglobin content was 10.4 gm. per 100 cc. Leukocytes numbered 31,000 per cu. mm., 84 per cent of them polymorphonuclear cells. Urinalysis was within normal limits except for a slight trace of albumin. The blood urea nitrogen was 10 mg. per 100 cc.

Roentgenographically a large retroperitoneal mass was seen on the right side obliterating the psoas shadow and also displacing the lower pole of the right kidney laterally. The lumbar spine showed pronounced scoliosis to the left (Figure 1). Intravenous pyelography confirmed the diagnosis of a large retroperitoneal mass on the right side.

At operation a right paramedian incision was made and in the right side of the abdomen there was an extremely large, firm, nonfluctuant, retroperitoneal mass which extended from below the pelvic brim upward to the right kidney, displacing the abdominal viscera medially and anteriorly.

After the right colon was freed, the mass was found to lie entirely within the right psoas muscle, which was tightly stretched over it. The appendix, which was retrocecal, was shortened and thickened and the blood vessels were engorged. The base of the appendix was tightly adherent to the underlying psoas muscle. When the adherent base of the appendix was freed, a large amount of thick greenish-

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Submitted July 14, 1959.



Figure 1.—Preoperative film showing obliteration of right psoas shadow and scoliosis of lumbar spine.

yellow pus escaped from within the psoas muscle. Approximately 500 cc. of pus was aspirated from this abscess cavity. Subsequently, coliform bacilli grew on a culture of the material.

Appendectomy was performed and the abscess cavity drained by means of a Chaffin tube and a cigarette drain through the right flank. The pathologist's report on the appendix noted considerable edema with a heavy infiltration of lymphocytes and a few neutrophilic leukocytes. A diagnosis of sub-acute appendicitis was made.

The postoperative course was essentially uneventful. Both drains were spontaneously extruded on the fifth postoperative day. The patient was discharged on the tenth postoperative day with no further drainage from the flank wound. The temperature was normal and there was decided improvement in gait and general appearance.

A month after the operation the patient again complained of difficulty in extending the right hip and of slight temperature elevations daily. Upon examination a pronounced fluctuant, nontender swelling was noted in the right groin. Leukocytes numbered 25,000 per cm. A diagnosis of recurrent psoas abscess was made and the patient was treated for several weeks with antibiotics and repeated aspirations of thick greenish pus, culture of which again grew coliform bacilli. Improvement in the temperature and a decrease in the number of leukocytes were only temporary; increasing fever and



Figure 2.—Postoperative film showing sinus tract in psoas muscle.

leukocytosis soon followed, and the pus became too thick for adequate aspiration.

The patient was readmitted to hospital three months after the first operation, and the fluctuant mass in the groin was incised beneath the right inguinal ligament and lateral to the femoral vessels. About 500 cc. of thick greenish pus was aspirated, and the cavity was seen to pass beneath the inguinal ligament upward into the substance of the psoas muscle. Suction drainage by means of a catheter introduced from beneath the inguinal ligament was instituted. An x-ray film taken five days later following injection of a contrast medium (Lipiodol) through the catheter showed the residual sinus tract in the region of the psoas muscle (Figure 2).

Within two weeks, the groin wound had ceased draining and closed spontaneously. The patient regained about 40 pounds in weight, remained free of symptoms and walked with a normal gait.

SUMMARY

A case is presented of a right psoas abscess secondary to perforation of a retrocecal appendix. The onset of acute symptoms of psoas abscess followed by several months an attack of appendicitis which apparently gave rise to only minimal symptoms.

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Arteriovenous Fistula Between Right Renal Artery and Inferior Vena Cava

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JOSEPH J. KAUFMAN, M.D.,
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ARTERIOVENOUS FISTULA between the renal vessels is rare. Ten cases, with various causes, have been reported in the literature. Even rarer is arteriovenous fistula between the renal artery and the inferior vena cava. Such a case is reported herein. The right renal artery and the inferior vena cava were damaged by gunshot wounds to the right flank, and an arteriovenous fistula formed with a false aneurysm between the two vessels. Symptoms did not develop until two years after the injury and did not become disabling until eight years later.

CASE REPORT

The patient, a woman 28 years of age, was examined in consultation in December, 1956. Ten years previously she had been shot twice in the right lumbar area with a .38 caliber gun. One bullet went out just lateral to the right breast. Laparotomy was performed. The patient was told that the bullet

Submitted May 1, 1959.

had made a hole in the liver, but that she would be well. Recovery was uneventful.

In 1948 the patient married and became pregnant. During the third trimester of pregnancy, she noticed slight shortness of breath but was able to carry on quite well. Following delivery the shortness of breath persisted. As time went on, it gradually and progressively became worse but did not interfere with her daily activities.

In 1955 there was one episode of palpitation for two hours during which the heart beat strenuously but regularly and the shortness of breath was greatly increased. Besides this acute episode the patient noticed constant progression in the shortness of breath.

In December, 1956, just before she was examined in consultation, the shortness of breath had become so pronounced that any exertion occasioned gasping for air. The distress was greatest at the end of the day and in hot weather was almost unbearable. Even the effort of eating a meal made the patient so breathless that small frequent feedings were necessary. She was unable to do any housework. Taking a few steps made her breathless. In spite of this, there was no nocturnal dyspnea and she was comfortable with only one pillow at night. She had not noticed any swelling of the ankles but had noticed some pain in the legs on walking. There were no other symptoms.

Upon physical examination the patient was in no apparent distress at rest. No abnormal venous pulsation or venous distention in the neck was noted and the cervical nodes were not enlarged. The chest moved well with respiration. There were no adventitious sounds from the lungs. The heart beat was regular, with sinus rhythm at a rate of 90 per minute. The heart was enlarged. The point of maximal impulse was in the sixth interspace at the anterior axillary line. Both heart sounds were heard in all areas. There was a mitral systolic murmur at the apex. The second pulmonic sound was loud and split, and the second aortic sound was greater than the second pulmonic. Blood pressure was 174/98 mm. of mercury in both arms. In the epigastrium there was a loud "machinery" murmur with a sys-

TABLE 1.—Isotope-Blood Volume Study

Average Normal Female (20 to 60 yr.)	Preoperative	Postoperative (2 Weeks)	Postoperative (22 Months)
Weight	120 lb. (54.5 kilo)	120 lb. (54.5 kilo)	125.5 lb. (57 kilo)
Total volume in cc.'s.....	4100	3990	4275
Total volume in cc.'s/kilo.. 71.5	75.2	73.3	75.0
Plasma volume in cc.'s/kilo	52.5	49.9	42.0
Red cell mass in cc.'s/kilo	22.7	23.4	33.0
Hematocrit (percentage) .. 42.0	30.2	31.8	43.6
Interpretation	Total volume per kilo increased by increase in plasma volume.	Total volume per kilo reduced towards normal by reduced plasma volume per kilo	Normal limits

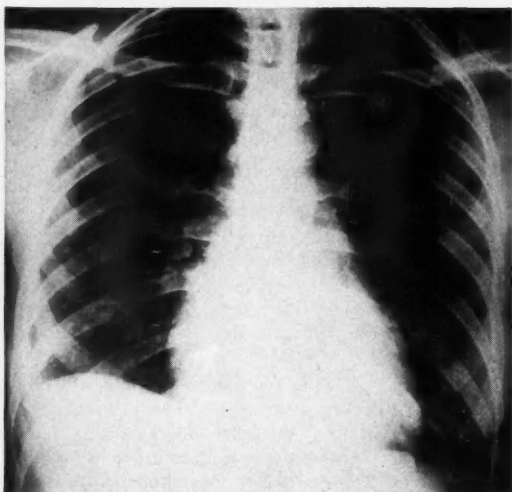


Figure 1.—Posteroanterior view of the chest, preoperatively. Cardiothoracic ratio 13.8:25.6.

tolic accentuation heard best just to the right of the midline. It was also heard well posteriorly in the interscapular area along the course of the aorta and was maximal posteriorly in the right costovertebral angle over the scars marking the entry of the bullets.

No abnormalities were noted in the urine. Hemoglobin content of the blood was 18.8 gm. per 100 cc. Erythrocytes numbered 3,400,000 per cu. mm. and leukocytes 5,600 with the cell differential 46 per cent polymorphonuclear, lymphocytes 50 per cent and eosinophils 4 per cent. Serologic tests were negative for syphilis. The hematocrit was 30 per cent and the corrected blood sedimentation rate was 2 mm. in one hour. The arm to tongue circulation time, using sodium dehydrocholate, was 13.5 seconds. Blood volume studies with radioactive isotopes showed the total volume per kilogram of body weight was above normal ratio, due to an increased amount of plasma. The red cell mass was below normal limits (Table 1).

Posterior and lateral radiographs of the chest showed no abnormality in the lung fields and a moderate enlargement of the heart, with no specific chamber enlargement (Figure 1). Fluoroscopy revealed no additional pertinent information.

A phonocardiogram made in the epigastrium recorded the "machinery" murmur heard in this area (Figure 2). A tracing of the loud systolic murmur heard at the apex is shown in Figure 3. (There was adventitious electrical interference with the tracing, but the murmur was demonstrated.) It was attributed to dilatation of the heart and corresponding enlargement of the mitral ring. An electrocardiogram was considered to be within normal limits. A renogram, using radioactive diodrast, showed normal supply of blood to both kidneys and normal function and drainage.

A polyethylene catheter inserted into the left

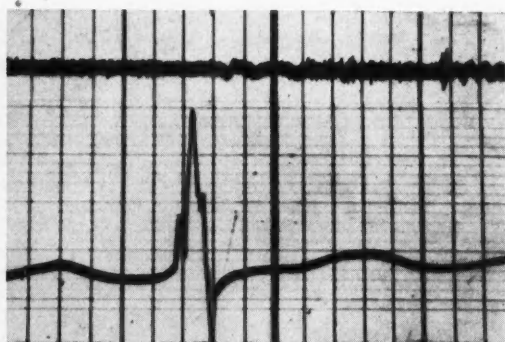


Figure 2.—Phonocardiogram from epigastrium, showing continuous systolic and diastolic "machinery" murmur.

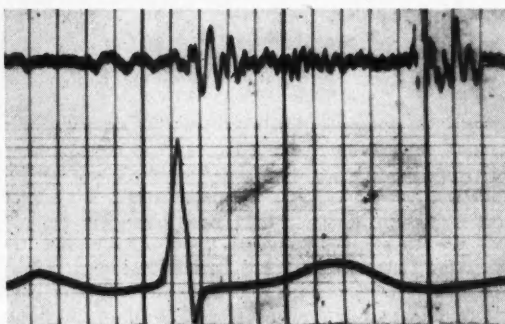


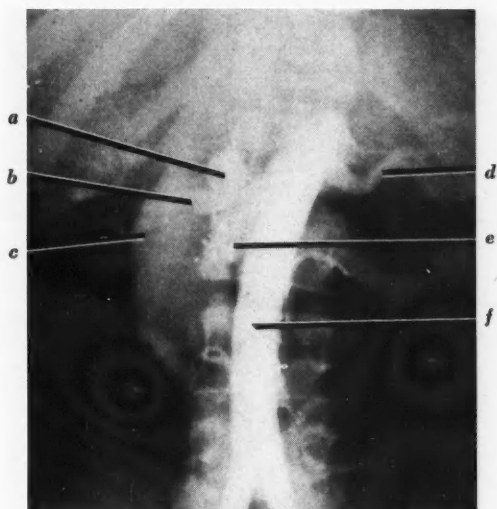
Figure 3.—Phonocardiogram at apex, showing systolic murmur at apex.

femoral artery was advanced to the level of the interspace between the first and second lumbar vertebrae. Contrast medium was injected rapidly and multiple exposures were made in quick succession. The films showed an arteriovenous fistula between the right renal artery and the vena cava (Figure 4). The right renal artery narrowed at a point 6 mm. beyond its branching from the aorta. There was a dilated aneurysmal deformity above the renal artery and behind the vena cava which was dilated. The deformity was a false aneurysm which opened into the vena cava. The dilated vena cava was rapidly filled through the fistula. The blood supply to the right kidney was essentially normal.

The diagnosis was traumatic arteriovenous communication between the right renal artery (6 mm. from its branching from the aorta) and the inferior vena cava, with a false aneurysm between the two vessels posterior to the vena cava.

Operation was done under hypothermia because of the possibility that the aorta above the renal arteries might have to be occluded for a considerable time to control flow of blood through the fistula during dissection.

After sedation was administered and intubation was completed, cooling was begun. A half hour later, when the temperature was 33.5° C., cooling



a, aneurysm; *b*, right renal artery; *c*, dilated inferior vena cava; *d*, left renal artery; *e*, lead foreign bodies over L₂; *f*, aorta.

Figure 4.—Aortogram showing aneurysm, dilated inferior vena cava and foreign bodies over the second lumbar vertebra.

was discontinued and the patient was transferred to the operating table. Operation was begun an hour after the beginning of cooling.

A right rectus keloid scar was excised. The peritoneum was opened and several loops of small bowel adherent to the scar were dissected free. The peritoneal reflection at the lateral border of the right colon and the duodenum was incised and the colon with the duodenum was reflected toward the left and medially to expose the inferior vena cava and the aorta. The vena cava was tense and distended. A pronounced thrill could be felt in the inferior vena cava, maximal at the level of the left renal vein and posterior to the vena cava. The vena cava was dissected on its anterior and medial aspect until it and the left renal vein were freed from the dense scar. The aorta medial to the vena cava, just below where the left renal vein crossed, was surrounded by dense adhesions. Pressure upon the aorta at this point caused disappearance of the thrill in the inferior vena cava, indicating that this was the point of origin of the arteriovenous fistula (Figure 5). The scar tissue was so dense that dissection was halted long enough to place tapes about the aorta, above and below the operative field, so that the flow of blood could be controlled. Then dissection of the fistula was begun. First the aorta was dissected from the scar tissue and the origin of the right renal artery was exposed. The stump of the renal artery was short and scarred. The right renal artery was doubly ligated, whereupon the thrill immediately disappeared from the vena cava and the tension in the vessel decreased.

At this point it was decided to divide the renal artery in order to avoid possible recanalization. The

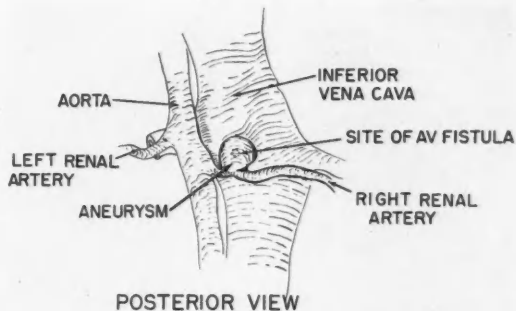


Figure 5.—Anatomical defect as seen at operation.

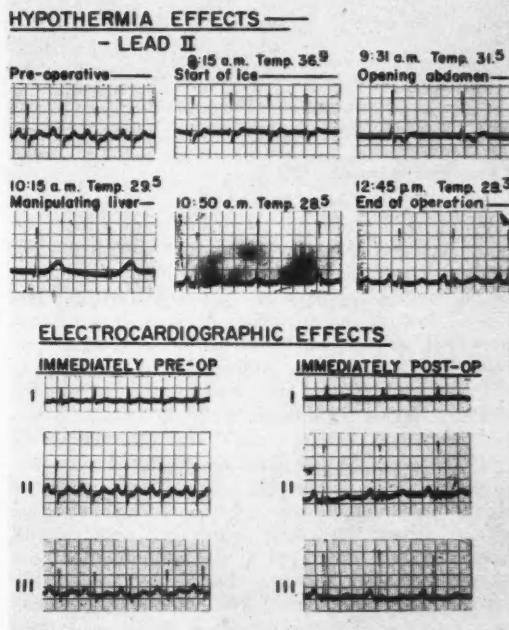


Figure 6.—Electrocardiographic effects during hypothermia.

fistula was clamped and cut, leaving a small cuff on the renal artery, which gave way. Hemorrhage was controlled by clamping the aorta above and below the renal artery and the edges of the hole were drawn together with a double layer of fine silk. The venous side of the fistula was closed with transfixion sutures and the clamps were removed. Gelfoam was inserted between the aorta and the vena cava. Next, the right kidney was dissected out lateral to the vena cava, the ureter ligated and divided, the renal pedicle ligated, transfixed and divided and the kidney removed. The abdomen was closed without drainage. At the end of the operation the patient was in excellent condition. The temperature was 28.3° C. The abdominal murmur had disappeared.

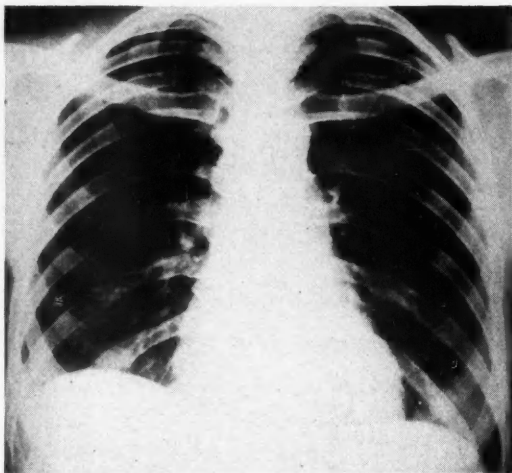


Figure 7.—Posteroanterior view of chest two weeks after operation. Cardiothoracic ratio 12.5:25.6.

Electrocardiographic Changes

Immediately before hypothermia was started in preparation for the operation, the temperature was 37.2° C., and the pulse rate was 98 with normal sinus rhythm. Following induction of anesthesia, nodal rhythm appeared and persisted for the duration of cooling and operation. Normal sinus rhythm appeared spontaneously when the operation was completed, although the temperature at the time was still 28.3° C. (Other observers have noted similar changes during anesthesia, with or without hypothermia.)

There were T wave changes associated with manipulation of the liver. The waves became inverted when the abdomen was opened, became elevated when the liver was manipulated, then diphasic and later returned to normal at the completion of the operation. These T wave changes were probably related to volume changes within the right ventricle as a result of changes in flow in the inferior vena cava.

The electrocardiogram immediately after operation had a rightward shift, somewhat lower T waves and a longer Q-T interval than before operation, although remaining within normal limits (Figure 6). The electrocardiogram remained unchanged during the rewarming period.

Nine hours after operation the blood pressure was 120/84 mm. of mercury and all limbs were being moved freely. The patient became normothermic about 13 hours after cooling had begun, without any artificial warming. The systolic murmur at the apex disappeared shortly after operation. The patient left the hospital on the seventh postoperative day.

Two weeks after operation there were no murmurs, the peripheral pulses were normal, the blood

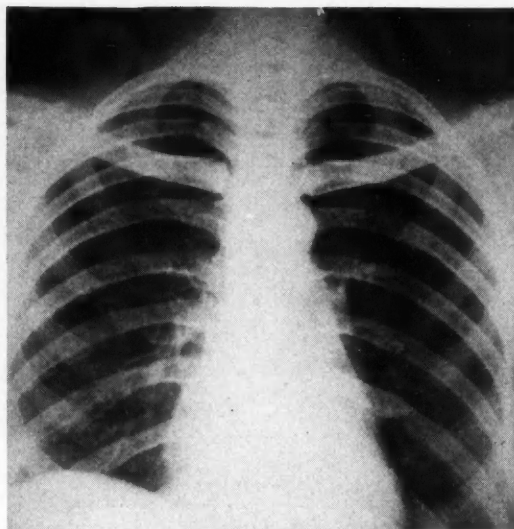


Figure 8.—Posteroanterior view of chest 22 months after operation. Cardiothoracic ratio 11.9:25.6.

pressure was 120/80 mm. of mercury. A considerable decrease in the size of the heart had occurred, the cardiothoracic ratio having diminished to 12.5:25.6 from 13.8:25.6 (Figure 7). A study of blood volume by radioactive tracer method showed the expected changes when compared with the preoperative results (Table 1), total blood volume per kilogram of body weight having decreased toward normal, mainly through a reduction in the plasma volume.

Twenty-two months after operation the patient was still asymptomatic, the physical findings were all normal, and the heart size was further reduced to a cardiothoracic ratio of 11.9:25.6 (Figure 8).

DISCUSSION

Use of an arterial graft for repair of the damaged right renal artery was considered preoperatively in this case, but the idea was abandoned at operation because the right renal artery had a short stump (only 6 mm.) and there was excessive scarring of the whole area. The left kidney being completely normal, removal of the right kidney was considered the most reasonable procedure.

An interesting feature of this case was that symptoms did not become evident until two years after injury and then only under the stress of pregnancy, which proceeded to term. Even after symptoms developed it was almost eight years before the disability became so severe that medical assistance was sought.

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California MEDICINE

For information on preparation of manuscript, see advertising page 2

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EDITORIAL

Health Insurance for Federal Employees

LATE IN SEPTEMBER President Eisenhower signed into law a new statute which provides for federal contributions toward the cost of medical care insurance for federal employees and their families.

This law is extremely important, both to federal employees and to physicians. For the first time, it recognizes "Uncle Sugar" as an employer who helps his employees meet their health care needs under a fringe benefit arrangement such as employees of private organizations have long enjoyed.

In addition, it offers each employee a variety of free choices—whether or not to participate, in what type of plan he wishes to participate, whether or not to include his family dependents, whether to shift from one kind of plan to another, whether he wants basic or more comprehensive coverage.

Members of labor unions and other groups covered under the familiar health and welfare plans never had it so good. While the great Uncle in Washington was late in arriving at his conclusion, it is obvious that he has finished up by maintaining for his employees the widest possible latitude of self-determination.

The new law, which calls for the subsidization of health care insurance coverage starting next July 1, is basically a plan of Government subsidies to individuals in Government employ who wish to purchase any one of a variety of health insurance coverages. The ground rules to be observed are left up to the federal Civil Service Commission. And that body has been atypically quick in getting out a list of questions and answers for the guidance of all federal employees.

The commission has issued a set of Q. and A. digests designed to acquaint federal employees with their rights and responsibilities under the new law. Apparently each employee is being given advance notice of the provisions of the law so that he may

plan his own ideas of coverage, now and in the future.

Several items in this publication by the Civil Service Commission will be interesting to physicians, many of whom will doubtless be seeing these employees and their families as participants in the program starting next July. Among these are:

1. Each federal employee may decide for himself whether or not he wishes to participate.
2. Each federal employee may decide for himself whether he wishes to cover only himself or his family members as well.
3. Each federal employee may choose between (a) a service-type plan, (b) an indemnity-type plan, (c) an employee-organization plan, or (d) a group-practice prepayment plan.
4. An employee may, when authorized, shift from one kind of coverage to another. He may add his family members or drop them from his coverage.
5. He may elect either of two levels of coverage under the service or indemnity-type programs. It is anticipated that the lower level of such plans will provide only what the Civil Service Commission refers to as "basic health" coverage and the higher level will add "catastrophe" coverage to this base.
6. The employee's share of the cost will be met through payroll deductions.
7. The government will contribute not less than \$2.80 monthly nor more than \$6.75 monthly toward the cost of each employee's health insurance. Basically, the Government's portion, to be paid from tax funds, will be 50 per cent of the cost of the coverage, up to a maximum total cost of double the amount of the Federal Government's maximum limits. If an employee wishes to purchase coverage in excess of \$5.60 a month for an individual or \$13.50 a month for a family, he will be expected to pay all the excess over the maximum federal portion applicable to him.

These are a few of the pertinent details of this

new program, a nationwide plan which will make its impact felt on the entire medical profession in the latter half of 1960. Since the plan is new and since it will cover a large number of patients, physicians should familiarize themselves with it in advance and prepare themselves for its inauguration.

Under the choice of plans available to each federal employee, a service-type plan is being developed by a Blue Shield-Blue Cross combination and will be offered for purchase by employees who choose it. An indemnity-type plan will be worked out by one commercial insurance company which, without doubt, will make it available for underwriting by a number of other carriers. The employee-organization plans will represent the continuation of some such organized plans already in existence, such as that sponsored by postal employees. The group-practice plans used by the Civil Service Commission as examples of this type of coverage include Health Insurance Plan of New York, Group Health Association in Washington, Kaiser Foundation in California, and others.

California is fortunate in having California Physicians' Service as a vehicle for participating in the service-type coverage for federal employees. It is likewise fortunate in having an active and aggressive insurance industry to take part in the indemnity-type plan. Since there are an estimated 300,000 federal employees in the state, or about 700,000 people when dependents are counted, these factors loom large in the prospective success of these plans. By the same token, the existence of these resources will be meaningless if they cannot be brought into the picture of participating in the federal employees' program.

At this moment nobody knows precisely what terms the Civil Service Commission will exact for its approval of health insurance plans. However, it is safe to assume that for service-type programs such as Blue Shield-Blue Cross, the requirement will be that the plan meet the full cost of the service contracted for so long as the plan member does not show an annual income above a specified ceiling. A question remains, so far as California is concerned, as to how high this ceiling shall be.

California Physicians' Service now operates three

service plans, with family income ceilings of \$4,200, \$6,000 and \$7,200. The fees allowed to participating physicians vary under these plans, the highest fee, as expected, going to those serving patients in the highest ceiling category.

The \$7,200 income ceiling with CPS Schedule C is the most appropriate for federal employees in California. However, it is obvious that the plan could be offered only in those counties where the county medical society has approved that ceiling and the accompanying factor of five for the Relative Value Study as a fee basis.

Further details on this whole plan will be forthcoming in the next few months, as the Civil Service Commission develops its own ground rules. Meanwhile, California doctors should be aware of what is in store for the many federal employees in this state and what they themselves may expect if they are chosen by these employees as the purveyors of their medical needs.

County medical societies may well find this topic an apt one for discussion in the next few months. Where CPS income ceilings have been retained at the lower levels by county society action, the societies and their members may want to consider the advisability of increasing these levels. Obviously, such considerations will be more meaningful in areas where a large number of federal employees are located.

Uncle Sam has broken several precedents in voting this law. Federal employees are given a fringe benefit; they are covered under a payroll deduction plan for the first time; they are given an apparently wide choice of plans, coverages and costs.

It is to be hoped that the medical profession will give adequate study to the new program, will be flexible enough to adjust to the terms to be laid down for the various plans to be made available and will continue to provide the finest medical care for those patients who, as federal employees, may be coming into physicians' offices with insurance contracts for the first time.

The Council has extensively discussed the implications of the new law and it would seem almost imperative that county societies keep themselves fully conversant with developments under it.

California MEDICAL ASSOCIATION

NOTICES & REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 452nd Meeting of the Council, Rickey's, Palo Alto, Calif., September 19, 1959.

The meeting was called to order by Chairman Lum in the Executive Conference Room of Rickey's, Palo Alto, California, on Saturday, September 19, 1959, at 9:30 a.m.

Roll Call:

Present were President Reynolds, President-Elect Foster, Speaker Doyle, Vice-Speaker Heron, Secretary Hosmer and Councilors MacLaggan, Wheeler, Todd, Quinn, O'Neill, Kirchner, O'Connor, Shaw, Gifford, Harrington, Davis, Sherman, Campbell, Lum, Bostick and Teall. Absent for cause, Editor Wilbur.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Thomas, Clancy, Collins, Marvin, Whelan, Edwards, Salisbury and Dr. Batchelder of C.M.A. staff; Messrs. Hassard and Huber of legal counsel; Mr. Ben H. Read of the Public Health League of California; county society representatives Geisert and Smith of Kern, Fred O. Field of Los Angeles, Neick of San Francisco, Wood of San Mateo, Donovan and Colvin of Santa Clara and Dermott of Sonoma; Dr. Clyde L. Boice of Santa Clara County; Dr. A. E. Larsen and Messrs. Etchel Paolini and Richard Lyon of California Physicians' Service; Dr. Dan O. Kilroy, legislative chairman; Dr. John Keye of the State Department of Social Welfare; Dr. Robert Dyar of the State Department of Public Health; Drs. Crawford Sams and W. W. Stiles, Chairman and Secretary of the Medical Advisory Committee to the Organizing Committee of the VIII Olympic Games; Dr. L. Henry Garland.

1. Minutes for Approval:

On motion duly made and seconded, minutes of the 451st meeting of the Council, held August 8, 1959, were approved.

2. Membership:

(a) A report of membership as of September 17, 1959, was submitted and ordered filed.

(b) On motion duly made and seconded, 29 delinquent members, dues now received, were voted reinstatement.

(c) On motion duly made and seconded in each instance, two members were voted Retired Membership. These were: M. E. Mesriow, Santa Barbara County, and Norman R. Sullivan, Santa Cruz County.

(d) On motion duly made and seconded, Dr. David Rosendale of Sacramento County was elected to Associate Membership.

(e) On motion duly made and seconded in each instance, 13 members were voted a reduction in dues because of illness or postgraduate study.

3. Report of the President:

President T. Eric Reynolds reported on a request received from the prepayment dental care plan sponsored by the California State Dental Association, asking for consultation with representatives of California Physicians' Service. On motion duly made and seconded, it was voted to request the Board of Trustees of California Physicians' Service to hold preliminary discussions with dental representatives on the subject of prepayment.

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DONALD D. LUM, M.D.	Chairman of the Council
SAMUEL R. SHERMAN, M.D.	Vice-Chairman of the Council
MATTHEW N. HOSMER, M.D.	Secretary
DWIGHT L. WILBUR, M.D.	Editor
HOWARD HASSARD	Executive Director
JOHN HUNTON	Executive Secretary
General Office, 693 Sutter Street, San Francisco 2 • Prospect 6-9400	
ED CLANCY	Director of Public Relations
Southern California Office:	
2975 Wilshire Boulevard, Los Angeles 5 • DUnkirk 5-2341	

4. *Financial:*

(a) A report of bank balances and current obligations as of September 17, 1959, was presented and ordered filed.

(b) Mr. Hunton asked authority to shift several items in the budget from one account to another without adding any financial sums. On motion duly made and seconded, this authority was voted.

(c) Mr. Hunton reported that a meeting of the Board of Directors of the Trustees of the California Medical Association would be called during the day, for the purpose of authorizing the establishment of a line of credit with the bank so as to permit seasonal borrowing as needed; authority would also be asked to require only one signature on checks up to \$500 and two signatures on larger items.

5. *Committee on Nominations:*

Councilor Bostick, chairman of the Committee on Nominations, reviewed the program planned for the meeting of county society officers for October 10 and 11, 1959, which was tacitly approved.

6. *State Department of Social Welfare:*

Councilor Sherman, chairman of the liaison committee to the State Department of Social Welfare, reported that appointments for membership on the Advisory Committee to this department would soon be forthcoming and suggested that the Association make three nominations for such appointments. On motion duly made and seconded, the suggested procedure was approved.

7. *C.P.S. Fee Schedule Allowances:*

On motion duly made and seconded, it was voted to request the California Physicians' Service to advise its physician members of the procedure to be followed in billing for prolonged office visits under C.P.S. Schedules A and B.

8. *State of California Fee Allowances:*

Chairman Lum read a communication received from the Pacific Roentgen Society relative to the adjustment of fees to be paid by various departments of the state government for professional services. On motion duly made and seconded, it was voted to refer this matter to the Committees for Emergency Action and Legislation as a part of the overall matter of professional fees to be paid by the state.

9. *Services of Internists:*

Chairman Lum read a communication received from the president of the California Society for Internal Medicine relative to fees paid by the State of California for specialists' services. On motion duly made and seconded, it was voted to refer this to the Commission on Medical Services, for study and

a progress report to the Council by January, 1960, and a final report before the 1960 Annual Session.

10. *Migrant Farm Workers:*

Councilor MacLaggan gave a progress report for the Committee on Rural Health, which is currently studying the problem of medical care for migrant farm workers. The Committee is investigating the problems peculiar to both native and alien farm employees and will make a later report.

11. *Commission on Medical Education:*

On motion duly made and seconded, it was voted to approve an invitation to be issued to Dr. Lauren V. Ackerman of St. Louis to appear as a guest speaker on the 1960 Annual Session program of the Committee on Scientific Work.

12. *Commission on Professional Welfare:*

Councilor Kirchner reported that the Medical Review and Advisory Board would work with representatives of the hospital organizations on matters of professional liability insurance coverage.

13. *Dates for Annual Session:*

Mr. Hunton reviewed the dates reserved for annual sessions for the next five years.

14. *Olympic Winter Games, 1960:*

Councilor Davis reported on his inquiries into the setup for medical services for the 1960 Olympic Winter Games, scheduled to be held in Squaw Valley in February. He introduced Dr. Crawford Sams, chairman, and Dr. W. W. Stiles, secretary, of the Medical Advisory Committee to the Organizing Committee of the VIII Olympic Games, who outlined the medical procedures planned for the care of contestants, spectators, employees and press representatives at this event.

Dr. L. Henry Garland, a member of the National Ski Patrol System, also commented on these arrangements and expressed the wish of that organization to make sure that medical care arrangements were proper and adequate.

On motion duly made and seconded, it was voted to express a vote of confidence to Drs. Sams, Stiles, Garland and their associates and to communicate with the Organizing Committee with a view toward proceeding as expeditiously as possible with the completion of medical care arrangements for the various groups involved, with physicians who work with the National Ski Patrol System and other organizations to be scheduled for professional services under the direction of the Medical Director of the Organizing Committee and its Medical Advisory Committee.

15. *Commission on Public Policy:*

Committee on Legislation: Dr. Dan O. Kilroy, chairman of the Committee on Legislation, reported

that the American Medical Association would sponsor a meeting in St. Louis on October 2 and 3 for the discussion of federal legislation proposals and that he, Mr. Salisbury and Dr. J. Lafe Ludwig would attend.

Dr. Kilroy also reported that his committee was arranging the appearance of representatives at a Congressional hearing to be held in San Francisco October 28 and 29.

Messrs. Read and Salisbury reported on interim committee hearings scheduled by a number of committees of the California State Legislature and reported that adequate representation would be provided.

16. *Legal Department:*

Mr. Hassard reported that Congress has passed and sent to the President (who is considered sure to approve) S. 2162, a bill to provide contributions to federal employees toward the purchase of health care insurance coverage. The plan would go into effect July 1, 1960, to cover about 2,000,000 federal employees and their families. The government would provide a portion of the premium cost to each employee.

17. *State Department of Public Health:*

Dr. Robert Dyar of the State Department of Public Health reported that the department has established a division of research, to serve as a staff arm of the director's in such matters as air and water pollution, radiation hazards, alcoholism rehabilitation, etc.

Dr. Dyar also reported on the success of a program of the department's under which medical students are recruited for summer periods for studies designed to orient the students in public health responsibilities.

18. *California Physicians' Service:*

Dr. Heron reported that the commercial program of California Physicians' Service was operating on a basis to cover all costs and that the total business of C.P.S. during the past year amounted to more than \$60,000,000 gross, including about \$22,000,000 in funds for governmental programs.

19. *New and Miscellaneous Business:*

(a) Mr. Hunton presented the application of two members who had previously requested the use of portions of the Association's mailing list and such use had been denied. On motion duly made and seconded, it was voted to reaffirm this denial.

(b) Communications from a member asking Council support of a proposal to establish a new

scientific section were presented. On motion duly made and seconded, it was voted to advise the writer of the procedure for establishing a new scientific section under an amendment to the By-Laws.

(c) Councilor Gifford urged that all possible assistance be given to the California Medical Assistants' Association, a statewide organization of employees of physicians.

Adjournment:

There being no further business to come before it, the meeting was adjourned at 4:25 p.m.

DONALD D. LUM, M.D., *Chairman*

MATTHEW N. HOSMER, M.D., *Secretary*

CONSTITUTIONAL AMENDMENT OFFERED

(Second Printing)

A proposed amendment to the Constitution of the California Medical Association was offered at the 1959 session and, in accordance with provisions of the Constitution, was referred to the Reference Committee on Amendments to the Constitution and By-Laws. The proposed amendment must lie on the table for one year and be published twice during that period in CALIFORNIA MEDICINE.

The reference committee suggested that this proposal be studied by the Constitution Study Committee during the year. The proposal will be referred in 1960 to a reference Committee for additional study and recommendations to the 1960 House of Delegates.

Constitutional Amendment No. 1.

Author: Arthur Olson.

Representing: Santa Barbara County Medical Society.

Resolved: That Article VIII of the Constitution of the C.M.A. be amended by renumbering the present sections in said Article to 2, 3 and 4 and inserting a new Section 1 as follows:

Section 1.—Eligibility for Appointment

Eligibility for appointment or election to any position, to any committee, or to in any way represent the C.M.A., or to formulate policy for C.M.A., shall depend on the member's not holding a salaried position with or acting in an advisory capacity for, or being retained by a commercial insurance company or health plan which handles health or accident problems during the term of election or appointment. Nor shall such delegates or committee members hold a remunerative political position either appointive or elective. Association with California Physicians' Service is specifically excluded.

In Memoriam

BORDEN, FREDERICK (FRED) WALLACE. Died in San Francisco, September 24, 1959, aged 65, after cardiac operation. Graduate of Stanford University School of Medicine, Stanford-San Francisco, 1929. Licensed in California in 1930. Doctor Borden was a member of the Santa Clara County Medical Society.



CALDER, JAMES RALPH. Died August 18, 1959, aged 40. Graduate of McGill University Faculty of Medicine, Montreal, Quebec, Canada, 1947. Licensed in California, 1955. Doctor Calder was a member of the Los Angeles County Medical Association.



DILLINGHAM, FRANK S. Died August 31, 1959, aged 80, of coronary thrombosis. Graduate of University of Southern California School of Medicine, Los Angeles, 1900. Licensed in California in 1900. Doctor Dillingham was a retired member of the Los Angeles County Medical Association and the California Medical Association and an associate member of the American Medical Association.



DILLON, JAMES R. Died in Napa, October 6, 1959, aged 75. Graduate of Cooper Medical College, San Francisco, 1912. Licensed in California in 1912. Doctor Dillon was a retired member of the San Francisco Medical Society and the California Medical Association and an associate member of the American Medical Association.



MERRILLAT, IRENE S. Died in Glendale, September 25, 1959, aged 61. Graduate of Stritch School of Medicine, Loyola University, Chicago, Illinois, 1925. Licensed in California in 1932. Doctor Merrillat was a member of the Los Angeles County Medical Association.

NEWMAN, HENRY WISE. Died in Belvedere, September 19, 1959, aged 52. Graduate of Stanford University School of Medicine, Stanford-San Francisco, 1931. Licensed in California in 1931. Doctor Newman was a member of the San Francisco Medical Society.



OTTO, FRANK WESLEY. Died September 23, 1959, aged 67. Graduate of College of Physicians and Surgeons, Los Angeles, 1921. Licensed in California in 1921. Doctor Otto was a member of the Los Angeles County Medical Association, a life member of the California Medical Association, and a member of the American Medical Association.



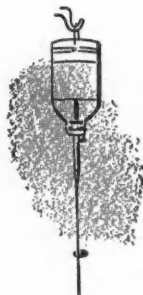
SMITH, M. ZENOS. Died August 30, 1959, aged 46. Graduate of Baylor University College of Medicine, Houston, Texas, 1941. Licensed in California in 1954. Doctor Smith was a member of the Santa Clara County Medical Society.



WAKEFIELD, ROBERT S. Died September 4, 1959, aged 34. Graduate of University of Texas Southwestern Medical School, Dallas, 1953. Licensed in California in 1954. Doctor Wakefield was a member of the Riverside County Medical Association.



WELLS, WALKER MARSHALL. Died September 23, 1959, aged 56, of myocardial infarction due to arteriosclerotic heart disease. Graduate of Stanford University School of Medicine, Stanford-San Francisco, 1937. Licensed in California in 1937. Doctor Wells was a member of the Alameda-Contra Costa County Medical Association.



PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.

Director, State Department of Public Health

STATE AND FEDERAL matching funds totalling \$15,641,234 were allocated to 32 hospital and health center construction projects at the late September meeting in Los Angeles of the State Advisory Hospital Council of the California Department of Public Health.

The funds, which represent two-thirds financing of the projects, were allocated to general, psychiatric and chronic hospitals, nursing homes, diagnostic and treatment centers, rehabilitation facilities and public health centers.

By category, the funds were allocated as follows (the amounts shown represent total state-federal matching funds):

General: Mono County Hospital, \$237,230; Intercommunity Hospital, Covina, \$1,033,480; Queen of the Valley Hospital, Covina, \$2,231,250; Antelope Valley Hospital, Lancaster, \$1,175,272; San Benito Hospital, Hollister, \$659,802; Wheeler Hospital, Gilroy, \$689,264; Marin General Hospital, San Rafael, \$1,486,374; St. Jude Hospital, Fullerton, \$735,057, and Southern Monterey County Memorial Hospital, King City, \$573,280.

Psychiatric: Pacoima Memorial Lutheran Hospital, Pacoima, \$278,414; The Gateways, Los Angeles, \$580,420; St. Francis Hospital of Lynwood, \$360,328; St. Joseph Hospital, Orange, \$278,464, and Methodist Hospital of Southern California, Arcadia, \$100,732.

Health Centers: Monterey County, \$370,750; Sonoma County, \$211,090; Stanislaus County, \$293,406; Ventura County, \$285,550, and Los Angeles City, Western District, \$199,810.

Chronic: St. Francis Hospital of Lynwood, \$570,498.

Nursing Homes: Sharp Memorial Community Hospital, San Diego, \$279,400; West Contra Costa County Hospital District, San Pablo, \$279,400; St. Joseph's Nursing Home, Ojai, \$116,214; St. John's Hospital, Oxnard, \$139,062; Tulare Hospital District, Tulare, \$198,020; St. Agnes Hospital, Fresno, \$188,344, and Mercy Hospital, Sacramento, \$157,736.

Diagnostic and Treatment Centers: Monterey County Hospital, Salinas, \$131,516, and East Bay Children's Hospital, Oakland, \$384,806.

Rehabilitation: Casa Colina Rehabilitation Center, Pomona, \$216,056; Crystal Springs Rehabilitation Center, San Mateo, \$239,260, and Memorial Hospital of Long Beach, \$265,804.

Progress in the development of air quality and motor vehicle exhaust standards in the control of air pollution was described at an October meeting of the State Board of Public Health.

The proposed standards were for presentation at a public hearing in Los Angeles, November 10, and will be submitted to the Board of Health for approval at its December 4 meeting in Berkeley.

In compliance with a mandate from the State Legislature, the standards will be submitted to the Governor by February 1, 1960. The air quality standards will reflect the relationship between the intensity and composition of air pollution and health, illness, including irritation to the senses, death in humans and damage to vegetation and interference with visibility.

The department has completed a summer training program for 36 medical students from 22 schools. Each student was assigned to a specifically planned project with a tutor. In this experience the student acquired some skill in the delineation of a problem, the definition of objectives, the development of protocol and the collection and analysis of data.

Projects included the study of occupational hazards in the explosives industry, the association of respiratory disease mortality to air pollution, social problems in the operation of nursing homes, determination of vitamin C levels and needs in older persons, the study of neurotropic virus diseases, investigation of an outbreak of Q fever, the relationship of suicide to homicide, studies of chronic alcoholism and the evaluation of case-finding of congenital anomalies.

Students were selected on the basis of scholarship, interest in the program and recommendations from medical schools in the country. Twenty-nine of the students indicated a desire to return next year and 23 said they would be interested in a similar program in the health department of their own state.

3 POSTGRADUATE COURSES

During

C.M.A. ANNUAL SESSION

February 21 to 23, 1960 • Los Angeles

THE CALIFORNIA MEDICAL ASSOCIATION in cooperation with the Medical Schools of UNIVERSITY OF CALIFORNIA, LOS ANGELES, UNIVERSITY OF SOUTHERN CALIFORNIA and COLLEGE OF MEDICAL EVANGELISTS, will present three Postgraduate Courses during the Annual Session in February. These courses will be clinically oriented and will include case presentations and closed circuit television.

Choose the course which most interests you, follow the course, and the 1960 session will send you back to your practice stimulated and refreshed.

Look for the program giving complete details which will arrive in your office in January.

• By UNIVERSITY OF CALIFORNIA SCHOOL OF MEDICINE, LOS ANGELES:

INFECTIOUS DISEASES—9 hours

Time: Sunday, Monday and Tuesday, February 21, 22 and 23, 1960—9:00 a.m. to 12:00 noon.

Place: February 21 at Chapman Park Hotel, February 22 and 23 at Ambassador Hotel, Los Angeles.

• By UNIVERSITY OF SOUTHERN CALIFORNIA:

CLINICAL ENDOCRINOLOGY—9 hours

Time: Sunday, Monday and Tuesday, February 21, 22 and 23, 1960—9:00 a.m. to 12:00 noon.

Place: February 21 at Los Angeles County Hospital, February 22 and 23 at Ambassador Hotel, Los Angeles.

• By COLLEGE OF MEDICAL EVANGELISTS:

MINOR SURGERY IN THE OFFICE—9 hours

Time: Sunday, Monday and Tuesday, February 21, 22 and 23, 1960—9:00 a.m. to 12:00 noon.

Place: White Memorial Hospital, Los Angeles.

Tuition Fee: \$25.00 for each course

----- APPLICATION FOR ENROLLMENT -----

Mail to: POSTGRADUATE ACTIVITIES, CALIFORNIA MEDICAL ASSOCIATION
2975 Wilshire Boulevard, Los Angeles 5, California

With check or money order in the amount of \$25.00 made payable to CALIFORNIA MEDICAL ASSOCIATION

Name _____

Address _____

I am in General Practice _____ I limit my practice to _____

Medical School Attended _____ Year of Graduation _____

Please enroll me in the course indicated by ✓.

- ☐ 1. Minor Surgery in the Office (9-hour course, Sunday, Monday and Tuesday mornings)
- ☐ 2. Infectious Diseases (9-hour course, Sunday, Monday and Tuesday mornings)
- ☐ 3. Clinical Endocrinology (9-hour course, Sunday, Monday and Tuesday mornings)

APPLICATION FOR HOUSING ACCOMMODATIONS

FOR YOUR CONVENIENCE in making hotel reservations for the coming meeting of the **California Medical Association**, February 21*-24, 1960, Los Angeles, hotels and their rates are at the right. Use the form at the bottom of this page, indicating your first and second choice. Because of the limited number of single rooms available, your chance of securing accommodations of your choice will be better if your request calls for rooms to be occupied by two or more persons. **All requests for reservations must give definite date and hour of arrival as well as definite date and approximate hour of departure; also names and addresses of all occupants of hotel rooms must be included.**

Eighty-ninth Annual Session CALIFORNIA MEDICAL ASSOCIATION Los Angeles, California FEBRUARY 21*-24, 1960

HOTEL ROOM RATES[†]

AMBASSADOR HOTEL	Single	Twin Beds	Suites
3400 Wilshire Boulevard			
Main Building.....	12.00-22.00	16.00-26.00	32.00-44.00
Garden Studios.....	18.00-28.00	22.00-32.00	44.00-58.00
CHAPMAN PARK HOTEL			
3405 Wilshire Boulevard.....	9.00-10.00	14.00	20.00
Bungalows.....		16.00	25.00-40.00
THE GAYLORD HOTEL			
3355 Wilshire Boulevard.....		12.50	18.00
HOTEL CHANCELLOR			
3191 West Seventh Street..	9.00	12.00	
SHERATON-WEST (formerly Sheraton-Town House)			
2961 Wilshire Boulevard.....	12.50-18.00	17.50-23.00	34.00

ALL RESERVATIONS MUST BE RECEIVED BEFORE: JANUARY 15, 1960

*February 20: House of Delegates will start with evening meeting Saturday, February 20.

†The above quoted rates are existing rates but are subject to any change which may be made in the future.

CALIFORNIA MEDICAL ASSOCIATION

693 Sutter Street
San Francisco 2, California

Please reserve the following accommodations for the 89th Annual Session of the California Medical Association, in Los Angeles February 21-24, 1960. (House of Delegates members: First meeting of House begins Saturday evening, February 20.)

Single Room \$..... Twin-Bedded Room \$.....

Small Suite \$..... Large Suite \$..... Other Type of Room \$.....

First Choice Hotel..... Second Choice Hotel.....

ARRIVING AT HOTEL (date):..... Hour:..... A.M. P.M. } Hotel reservations will be held until
Leaving (date):..... Hour:..... A.M. P.M. } 6:00 P.M., unless otherwise notified

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of both persons for each twin-bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

Individual Requesting Reservations—Please print or type

Name.....

Address.....

Officer?..... Delegate?..... Alternate?.....

County.....

City and State.....



WOMAN'S AUXILIARY

TO THE CALIFORNIA MEDICAL ASSOCIATION

THE FALL CONFERENCE of the Woman's Auxiliary to the California Medical Association was held in Santa Barbara, September 21 through 23, 1959. This was a "workshop" meeting for State Board members, county auxiliary presidents and presidents-elect, branch chairmen, presidents, and presidents-elect and all other interested auxiliary members.

There were 129 auxiliary members registered at the conference, including the National Auxiliary president, Mrs. Frank Gastineau, 32 State Board members, 30 county presidents, 25 county presidents-elect, 13 branch representatives and 28 guests. Santa Barbara Auxiliary provided 12 hostesses to facilitate transportation from the airport and to conduct tours in the Santa Barbara area.

Mrs. Gastineau addressed the members attending the opening meeting of the conference on September 21 at the Santa Barbara Biltmore Hotel. She gave a most informative talk on auxiliary policies and the problems facing the medical profession today. In her summary she advised us to "remember that the bouquet handed to you by the government has been picked from your own yard."

At our dinner meeting on Monday evening honoring Mrs. Gastineau and Dr. T. Eric Reynolds, president of the California Medical Association, Dr. Reynolds spoke to us on "Problems of the Aging." He added ways in which the county auxiliaries might be of help in assisting the Homemaker Services and similar organizations that are already established in many communities to help the aged population.

Dr. Arlo Morrison of Ventura, a past president of the California Medical Association, Dr. William Quinn, president of the Los Angeles County Medical Association, and Mr. Robert Huber, representing legal counsel for the C.M.A., shared the speakers' platform at our final meeting on Wednesday morning.

Dr. Morrison talked to us on legislation. He outlined the structure of the legislature with its 40 senators and 80 assemblymen. The California Medi-

cal Association has three full-time lobbyists and when the legislature is in session the chairman of the C.M.A. Legislative Committee and a member of the legal counsel for the C.M.A. attend the meetings for a total of five representatives for the C.M.A. Dr. Morrison also told how legislative bills are written and introduced and how these bills may be changed, rewritten or killed in committee.

Dr. Quinn set the stage for his more serious discussion of the "Attitude of the Doctor's Wife Toward His Profession and the Community" by relating a few anecdotes. He offered some excellent advice, most pertinent was that "the doctor's wife should learn when to keep her mouth shut."

Mr. Huber discussed the admission tax that affects the auxiliary fund raising projects. He stated that convention and conference expenses incurred by auxiliary members are *not* tax-deductible. Nursing scholarship funds that have been raised in the counties by ticket sales advertised for that purpose should not be used for other purposes, he cautioned.

We are indeed grateful to Drs. Reynolds, Quinn and Morrison and Mr. Huber for taking time from their busy schedules to come to Santa Barbara to speak at our conference. It exemplifies the unity and understanding between our Auxiliary and the California Medical Association.

During the conference a startling fact on Auxiliary membership figures was reported by Mrs. Warren Bostick, first vice-president and state membership chairman. There are 17,150 members in the C.M.A. and only 6,753 auxiliary members. In the unorganized counties there are approximately 200 doctors' wives eligible for membership while in the organized counties there are almost 10,000 doctor's wives in this category. We all have much work to do in the counties to interest eligible women in our auxiliary program.

Any C.M.A. member whose wife does not belong to the auxiliary is herewith urged to extend to her our special invitation to join us.

♦ MRS. THEODORE A. POSKA
*President, Woman's Auxiliary to the
California Medical Association*

NEWS & NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

The Twelfth Annual Midwinter Radiological Conference, sponsored by the Los Angeles Radiological Society, will be held at the Statler Hotel, Los Angeles, on Saturday and Sunday, January 30 and 31, 1960. Guest speakers will be Dr. John A. Evans, New York, Professor Knut Lindblom, Stockholm, Dr. James J. Nickson, New York, and Dr. E. Rohan Williams, London. The conference fee of \$20.00 includes two luncheon meetings featuring questions and answers. Further information may be obtained from Dr. Sidney D. Zucherman, 3741 Stocker Street, Los Angeles 8.

* * *

The Research Study Club of Los Angeles will hold its 29th annual Mid-Winter Convention in Ophthalmology and Otolaryngology, January 18 to 22, 1960, at the Ambassador Hotel, Los Angeles. Registration will begin January 17.

* * *

Dr. Joseph de los Reyes was elected a vice-president of the International College of Surgeons at the organization's annual meeting held in Chicago in September.

* * *

Doctor Fred B. Moor, professor of physical medicine and rehabilitation at the College of Medical Evangelists School of Medicine, has been awarded the gold key of the American Congress of Physical Medicine and Rehabilitation for outstanding services in the field of physical medicine and rehabilitation. The award was made at the recent annual meeting of the organization in Minneapolis.

* * *

Dr. Clarence W. Dail of Los Angeles has been elected president of the American Academy of Physical Medicine and Rehabilitation for 1959-1960.

SAN DIEGO

Dr. William W. Belford of San Diego was installed as the thirtieth president of the American Academy of Pediatrics at the academy's annual scientific meeting at the Palmer House in Chicago.

SAN FRANCISCO

Dr. John W. Cline was elected president-elect of the American Cancer Society at the annual meeting in New York last month. He will succeed to the presidency in 1961 and will serve as a vice-president in the interim.

Dr. David A. Wood was named to the executive committee of the board of directors of the Society.

* * *

At a meeting early last month the San Francisco-Stanford Hospital elected the following new officers: Dr. Forrest M. Willet, president; Dr. Victor Richards, vice-president; and Dr. Arthur Jampolsky, secretary.

The last of six in a series of lectures on Medical Aspects of Workmen's Compensation will be held Thursday afternoon, November 19, between 1:30 and 6 o'clock, in the auditorium of the San Francisco Medical Society. The lecture program has been presented by a subcommittee of the Industrial and Public Health Committee of the San Francisco Medical Society in cooperation with the San Francisco Workmen's Compensation Insurance Group.

* * *

The opening of the new Medical Library at San Francisco-Stanford Hospital was celebrated Friday evening, October 30, 1959, with a reception for San Francisco physicians, staff members and a distinguished group of emeritus professors from the Stanford University School of Medicine. The library is located in the former surgical teaching ward of Lane Hospital. Mrs. Maria Martinez is head librarian. Miss Clara Sue Manson, Lane Library librarian, supplied a large number of duplicate volumes upon the removal of Lane Library to the Stanford University campus.

SANTA CLARA

A book of delightful recipes, *Culinary Capers*, has just been published and put on sale by the North Branch Woman's Auxiliary of the Santa Clara County Medical Society. Profits from sales will go to the Children's Health Council of the Mid-Peninsula, which operates the "super clinic for kids" described by Milton Silverman in one of his articles in the *Saturday Evening Post* during the past year.

Mrs. W. Norman Sears and Mrs. Julian Pichel, the editors, have drawn on members for favorite recipes. The book is attractively laid out and sensibly bound with a spiral wire backbone for easy use on a kitchen counter. It is priced at \$2.20, but it is also offered at wholesale to other auxiliaries that may wish to sell it and retain profits for their own projects. Retail or wholesale, the books may be ordered from Mrs. J. Mayfield Harris, 11519 Crooked Creek Drive, Los Altos, California.

GENERAL

At a recent 1959 Scientific Assembly held by the California Academy of General Practice in Los Angeles, outgoing president Carroll B. Andrews of Sonoma passed on the presidential gavel to Leon O. Desimone of Los Angeles, and the Congress of Delegates elected Clarence T. Halburg, Redlands, to the office of president-elect. Dr. Halburg, who has been serving as Academy secretary, will be installed as president at the 1960 Assembly. J. Blair Pace of Oceanside was elected secretary.

In other action the Congress reelected Burt L. Davis, Palo Alto, speaker; Ralph L. Bennett, M.D., Los Angeles, vice-speaker; J. Alison Cary, Morgan Hill, American Academy of General Practice delegate; Daniel A. Tobin, Sacramento, American Academy of General Practice alternate; John A. Ariaudo, El Centro, District I director, and Leland Blanchard, San Jose, District VII director.

New directors elected were Harold E. Petersen, San Fernando, replacing Bernard J. Harvey, Monrovia, as one of the two District IV directors; and James J. Benn, Ripon, who succeeds John T. McNally, Stockton, as director of District X.

The board of directors elected Dr. Andrews to the executive committee and reelected John A. C. Leland, Berkeley, treasurer, and Frank W. Norman, Santa Rosa, editor of *California GP*.

POSTGRADUATE EDUCATION NOTICES

THIS BULLETIN of the dates of postgraduate education programs and the meetings of various medical organizations in California is supplied by the Committee on Postgraduate Activities of the California Medical Association. In order that they may be listed here, please send communications relating to your future medical or surgical programs to: Mrs. Margaret H. Griffith, Director, Postgraduate Activities, California Medical Association, 2975 Wilshire Boulevard, Los Angeles 5.

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Diarrhea. Friday and Saturday, November 20 and 21. Twelve hours. Fee: \$40.00.

Clinical Hematology. Friday and Saturday, December 4 and 5. Twelve hours. Fee: \$50.00.

6th Annual Symposium for X-ray Technicians. Saturday and Sunday, December 5 and 6. Ten and a half hours. Fee: \$15.00, includes Saturday lunch.

Clinical Traineeships—Anesthesia, Dermatology and Pediatric Cardiology. Dates by arrangement. Minimum period—two weeks. Fee: Two weeks, \$150.00; four weeks, \$250.00.

Special Announcement: A Postgraduate Course in Mexico City, in cooperation with Universidad Nacional Autonoma de Mexico Escuela Nacional de Medicina, Mexico, D. F. Instructional Staff will be drawn from the staff of the U.C.L.A. School of Medicine and the staff of the Universidad Nacional Autonoma de Mexico Escuela Nacional de Medicina. The program will include lectures and presentation of Clinical Cases in: Anesthesiology, Gastroenterology, Dermatology, Cardiology, Pediatrics and General Surgery. Wednesday, February 25 through Saturday, March 5, 1960.

Contact: Thomas H. Sternberg, M.D., Assistant Dean for Postgraduate Medical Education, U.C.L.A., Los Angeles 24. BRadshaw 2-8911, Ext. 7114.

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Recent Advances in External Diseases of the Eye. Thursday through Saturday, December 3 through 5. Twenty-four hours. Fee: \$60.00.

Vectorcardiography. Sunday, December 6. Seven hours. Fee: \$15.00.

Disorders of the Liver. Friday through Sunday, December 11 through 13. Twenty-one hours. Fee: \$50.00.

Man and His Environment—The Air He Breathes. Saturday through Monday, January 16 through 18. Twenty-one hours.*

Course for Physicians in General Practice (Mt. Zion Hospital, San Francisco). Monday through Friday, March 7 through 11. Thirty-five hours.*

Fundamental Practices of Radioactivity and the Diagnostic and Therapeutic Uses of Radioisotopes. Two or three month course limited to one enrollee per month. Fee: \$350.00.

Contact: Seymour M. Farber, M.D., Assistant Dean, Department of Continuing Medical Education, University of California Medical Center, San Francisco 22. MOnrose 4-3600, Ext. 665.

*Fees to be announced.

STANFORD UNIVERSITY SCHOOL OF MEDICINE

Morning Clinical Conferences, each Monday. **Contact:** D. H. Pischel, M.D., Professor, Division of Ophthalmology, Stanford University School of Medicine, Stanford Hospital, Clay and Webster Streets, San Francisco.

For information contact: Dean, Stanford University School of Medicine, 300 Pasteur Drive, Palo Alto.

UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES

Cardiac Resuscitation. Sponsored by the Los Angeles County Heart Association each Wednesday throughout the year, 4 to 6 p.m. USC Medical Research Building, Room 211, 2025 Zonal Avenue. Residents and interns of Los Angeles County, and all armed forces medical personnel admitted without fee. Tuition for all other physicians \$30.00. (Each session all-inclusive.)

Basic Home Course in Electrocardiography. One year postgraduate series, electrocardiogram interpretation by mail. Physicians may register at any time and receive all 52 issues. Fifty-two weeks. Fee: \$100.00.

Advance Home Course in Electrocardiography. One year postgraduate series, electrocardiogram interpretation by mail. Fifty-two issues: \$85.00. Physicians may register at any time.

Advances in the Diagnosis and Treatment in Gastroenterology. Friday through Sunday, January 15 through 17. Twenty-one hours. Fee: \$75.00 including lunch.

Bedsides Cardiology. Thursdays, February 4 through April 21. Twenty-four hours. Fee: \$65.00.

Therapeutic Interviewing. Thursdays, February 11 through April 28. Twenty-four hours. Fee: \$100.00.

Symposium on Hypertension. Friday, March 11. Seven hours. Fee: \$7.50.

Dermatology Clinic, One-Day Symposium. Thursday, March 24. Seven hours. Fee: \$25.00.

Funduscopy in Internal Medicine. Every other Tuesday, April 5 through June 14. Twelve hours. Fee: \$37.50.

Ward Walks in Rare Diseases. Thursdays, April 14 through June 16. Twenty hours. Fee: \$100.00.

Practical Diagnosis and Management of Cardiovascular Diseases. Dates to be announced. Twenty-one hours. Fee: \$75.00.

Contact: Phil R. Manning, M.D., Associate Dean and Director, Postgraduate Division, University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 33. CApital 5-1511.

COLLEGE OF MEDICAL EVANGELISTS

CLINICAL TRAINEESHIPS available in all clinical departments by arrangement with the Postgraduate Division and the Chairman of the department or departments involved. Eighty hours minimum. Fee: As arranged.

Diseases of the Chest: Two and four-week Traineeships in cooperation with the Los Angeles County Hospital. Dates as arranged.

Anesthesia. Monday through Friday. Date as arranged. Six months. Fee: \$350.

SPECIAL SKILLS available in the clinical departments, usually with a maximum of two or three students.

Surgical Anatomy: Thorax, Abdomen, Pelvis, January 4 through April 13. 121 hours. Fee: \$125.00. Head and Neck, April 20 through June 1, 63 hours. Fee: \$75.00.

Surgical Anatomy: Thorax, Abdomen, Pelvis, January 6 through April 13. Twenty-eight hours. Fee: \$50.00. Head and Neck, April 20 through June 1. Twenty-four hours. Fee: \$35.00.

ALUMNI POSTGRADUATE CONVENTION, held annually in cooperation with the Alumni Association of the School of Medicine. Refresher Courses, Sunday and Monday, February 28 and 29, at White Memorial Hospital, 1720 Brooklyn Avenue. Six hours each day. Fee: \$20.00 each day. Scientific Assembly, Tuesday through Thursday, March 1 through 3, at the Ambassador Hotel. Twenty-four hours. Fee: \$15.00. *Contact:* Walter Crawford, executive secretary, 316 N. Bailey Street, Los Angeles 33, ANgelus 2-2173.

TRAUMATOLOGY, a complete review including fractures and dislocations, soft tissue injuries, as well as complications involving the 3 cavities: Calvarium, thorax and abdomen. Limited to 15 candidates. Includes basic sciences, lectures, clinical demonstrations. Monday through Friday, March 7 through 11. Thirty-six hours. Fee: \$100.00.

TROPICAL PUBLIC HEALTH: Causes, treatment and management of diseases found in the warm climates. For physicians who plan to serve abroad and other ancillary personnel. Monday through Friday, April 1 through May 30. Fee: \$65.

JOINT MANIPULATION. Monday through Friday, 8:00 to 12:00, dates to be arranged. Twenty hours. Fee: \$75.00.

For information contact: G. E. Norwood, M.D., assistant dean and chairman, Division of Postgraduate Medicine, College of Medical Evangelists, 1720 Brooklyn Ave., Los Angeles 33. ANgelus 9-7241, Ext. 214.

CALIFORNIA MEDICAL ASSOCIATION POSTGRADUATE COURSES

ANNUAL SESSION POSTGRADUATE COURSES

Infectious Diseases. 9 hours. Sunday, Monday and Tuesday, February 21, 22 and 23, 9:00 to 12:00 noon. February 21 at Chapman Park Hotel, February 22 and 23 at Ambassador Hotel, Los Angeles. Program by University of California School of Medicine, Los Angeles.

Clinical Endocrinology. 9 hours. Sunday, Monday and Tuesday, February 21, 22 and 23, 9 to 12 noon. February 21 at Los Angeles County Hospital, February 22 and 23 at Ambassador Hotel. Program by University of Southern California School of Medicine.

Minor Surgery. 9 hours. Sunday, Monday and Tuesday, February 21, 22 and 23, 9 to 12 noon. All sessions at White Memorial Hospital, Los Angeles. Program by College of Medical Evangelists.

POSTGRADUATE INSTITUTES—1960 (Tenth Anniversary Year)

West Coast Counties in cooperation with University of California, San Francisco, February 4 and 5. Del Monte Lodge, Pebble Beach. *Chairman:* Robert A. Helfrich, M.D., 440 E. Romie Lane, Salinas.

North Coast Counties in cooperation with College of Medical Evangelists, March 31 and April 1. Flamingo Hotel, Santa Rosa. *Chairman:* H. Ward Wick, M.D., 858 Fourth Street, Santa Rosa.

Southern Counties in cooperation with Stanford University School of Medicine, April 21 and 22. Palm Springs Riviera. *Chairman:* Robert M. Zweig, M.D., 7004 Magnolia, Riverside.

San Joaquin Valley Counties in cooperation with University of Southern California School of Medicine, April 28 and 29. Ahwahnee Hotel, Yosemite. *Chairman:* Campbell H. Covington, M.D., 2057 High Street, Selma.

Sacramento Valley Counties in cooperation with UCLA School of Medicine, July 1 and 2. Tahoe Tavern, Lake Tahoe. *Chairman:* Herbert W. Korngold, M.D., 1217 30th Street, Sacramento.

Contact: One of the chairmen listed above, or Postgraduate Activities Office, California Medical Association, 2975 Wilshire Boulevard, Los Angeles 5.

AUDIO-DIGEST FOUNDATION, a nonprofit subsidiary of the C.M.A., offers (on a subscription basis) a series of six different hour-long tape recordings covering general practice, surgery, internal medicine, obstetrics and gynecology, pediatrics and anesthesiology. Designed to keep physicians posted on what is new and important in their respective fields, these programs survey current national and international literature of interest and contain selected highlights of on-the-spot recordings of national scientific meetings, panel discussions, symposia, and individual lectures. For information contact Mr. Claron L. Oakley, Editor, 1919 Wilshire Blvd., Los Angeles 57, Hubbard 3-3451.

Medical Dates Bulletin

NOVEMBER MEETINGS

AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS—District VIII Annual Meeting. Each morning, November 15 through 21. Royal Hawaiian Hotel, Honolulu. *Contact:* Harold K. Marshall, M.D., Secretary-Treasurer, District VIII, A.C.O.G., 202 Professional Building, Glendale.

AMERICAN COLLEGE OF PHYSICIANS Southern California Region Annual Basic Science Lectureship Dinner. November 20, Biltmore Hotel, Los Angeles. *Contact:* George C. Griffith, M.D., Governor for Southern California, A.C.P., P. O. Box 25, 1200 North State Street, Los Angeles 33.

INTERNATIONAL COLLEGE OF SURGEONS, Second Western Regional Meeting, Stardust Hotel, Las Vegas, Nevada, November 22 through 24. *Contact:* F. M. Turnbull, Jr., M.D., secretary-treasurer, 1930 Wilshire Boulevard, Los Angeles 57.

AMERICAN ACADEMY FOR CEREBRAL PALSY Annual Meeting, November 30 through December 2, Statler Hotel, Los Angeles. *Contact:* Margaret H. Jones, M.D., local arrangements chairman, associate professor of pediatrics, UCLA School of Medicine, Los Angeles 24.

DECEMBER MEETINGS

AMERICAN COLLEGE OF CHEST PHYSICIANS Fifth Annual Postgraduate Course on Diseases of the Chest. December 7 through 11. Ambassador Hotel, Los Angeles. *Contact:* Mr. Murray Kornfeld, Executive Director, 112 East Chestnut St., Chicago 11, Ill.

JANUARY 1960 MEETINGS

MARIN COUNTY HEART ASSOCIATION Cardiac Resuscitation. Each Saturday morning 8:30 to 12 noon, January 9 through February. Marin General Hospital. *Contact:* Jean M. Brown, executive director, 2044 Fourth Street, San Rafael. GLenwood 4-7347.

LOS ANGELES COUNTY HEART ASSOCIATION Fourth Annual Midwinter Symposium. January 13, 9:00 a.m. Statler-Hilton Hotel. *Contact:* Walter S. Graf, M.D., Chairman, Professional Symposium Committee, Los Angeles County Heart Association, 660 So. Western Avenue, Los Angeles 5.

ORANGE COUNTY HEART ASSOCIATION Annual Symposium on Heart Disease. January 23, 8:30 a.m. to 5:30 p.m. Gourmet Restaurant, Disneyland Hotel, Anaheim. *Contact:* Howard G. Buswell, Executive Director, P. O. Box 1704, Santa Ana, Kimberly 7-5976.

WESTERN ASSOCIATION OF PHYSICIANS. January 27 through 29. Carmel, California. *Contact:* Wade Volwiler, M.D., secretary, Department of Medicine, University of Washington, Seattle 5.

FRESNO COUNTY HEART ASSOCIATION Central California Eighth Annual Physicians Symposium. January 29, 8:30 a.m. to 5:30 p.m. Elks Club, Kings Canyon Road, Fresno. *Contact:* Max S. Millar, M.D., Chairman, Professional Services Committee, Fresno County Heart Association, 329 No. Van Ness, Fresno 1.

FEBRUARY 1960 MEETINGS

CONTRA COSTA COUNTY HEART ASSOCIATION Postgraduate Course for Physicians. Eight 2-hour weekly meetings. Monday, 8 to 10 p.m., beginning February 1. Contra Costa County Hospital. *Contact:* (Mrs.) Loyse C. Casebolt, executive director, 2030 N. Main Street, Walnut Creek.

AMERICAN COLLEGE OF PHYSICIANS Annual Southern California Regional Meeting. February 6 and 7. Hotel del Coronado, Coronado. *Contact:* George C. Griffith, M.D., Governor for Southern California, A.C.P., P. O. Box 25, 1200 North State St., Los Angeles 33.

CALIFORNIA MEDICAL ASSOCIATION Annual Meeting. February 21 through 24, Ambassador Hotel, Los Angeles. *Contact:* John Hunton, executive secretary, 450 Sutter Street, San Francisco 8; or Ed Clancy, director of Public Relations, 2975 Wilshire Blvd., Los Angeles 5.

PACIFIC COAST SURGICAL ASSOCIATION Annual Meeting. February 21 through 24. Palm Springs. *Contact:* Carleton Mathewson, M.D., professor of surgery, Stanford Hospital, San Francisco.

MARCH 1960 MEETINGS

SOUTHWESTERN PEDIATRIC SOCIETY Spring Lecture Series, March 1 and 2, Statler Hotel, Los Angeles. *Contact:* Wendell Severy, M.D., program chairman, 11633 San Vicente Blvd., Los Angeles 49.

SOUTHWESTERN SURGICAL CONGRESS. March 28 through 31, Riviera Hotel, Las Vegas, Nevada. *Contact:* Miss Mary O'Leary, executive secretary, 1213 Medical Arts Building, Oklahoma City, Oklahoma.

NEUROSURGICAL SOCIETY OF AMERICA. March 30 through April 2, Del Monte Lodge, Del Monte. *Contact:* Raymond K. Thompson, M.D., secretary, 803 Cathedral Street, Baltimore 1.

APRIL 1960 MEETINGS

AMERICAN SOCIETY OF INTERNAL MEDICINE. April 1 through 3. Mark Hopkins Hotel, San Francisco. *Contact:* Mr. Robert L. Richards, executive director, 350 Post Street, San Francisco 8.

AMERICAN COLLEGE OF PHYSICIANS Annual Meeting, April 4 through 9. Mark Hopkins and Fairmont Hotels, San Francisco. *Contact:* E. R. Loveland, executive secretary, 4200 Pine Street, Philadelphia 4.

CALIFORNIA MEDICAL ASSISTANTS ASSOCIATION Annual Convention. April 23 and 24. Claremont Hotel, Berkeley. *Contact:* Mrs. Anne Reece, President CMAA, 1837 So. Indiana St., Porterville, California.

MAY 1960 MEETINGS

HAWAII MEDICAL ASSOCIATION Annual Meeting. April 28 through May 1. *Contact:* Miss Lee McCaslin, executive secretary, 510 S. Beretania, Honolulu 13.

PAN AMERICAN MEDICAL ASSOCIATION CONGRESS. May 2 to 11. Mexico City. *Contact:* Joseph J. Eller, M.D., director general, 745 Fifth Avenue, New York, N. Y.

MEMORIAL HOSPITAL OF LONG BEACH Medical Staff 2nd Annual Scientific Symposium "New Horizons in Medicine," to be held in conjunction with the formal opening of the new 400-bed Memorial Hospital of Long Beach. May 4. *Contact:* George X. Trimble, M.D., director of medical education, Seaside Memorial Hospital, 1401 Chestnut Avenue, Long Beach 13.

VALLEY CHILDREN'S HOSPITAL Spring Clinics. May 5 through 7. Roosevelt High School auditorium, Fresno. *Contact:* Valley Children's Hospital, Shields and Millbrook Avenues, Fresno.

NEVADA ACADEMY OF GENERAL PRACTICE 1960 Annual Assembly. May 12 through 14. Riverside Hotel, Reno, Nevada. Scientific program by University of California School of Medicine. *Contact:* Roy M. Peters, M.D., general chairman, 475 So. Arlington, Reno, Nevada.

NATIONAL TUBERCULOSIS ASSOCIATION—AMERICAN TRUDEAU SOCIETY Annual Meeting. May 16 through 19. Statler Hilton and Biltmore Hotels, Los Angeles. *Contact:* Mr. Sherman Asche, general chairman, Annual Meeting Committee, P. O. Box 4037, Santa Barbara.

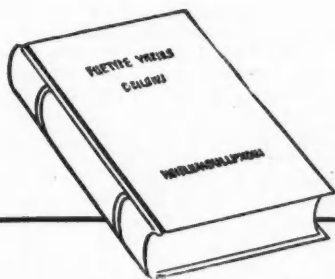
AMERICAN COLLEGE OF NUTRITION 1960 Annual Convention. May 20 through 22. Huntington Sheraton Hotel, Pasadena. *Contact:* Donald B. Haynie, executive secretary, 10651 West Pico Blvd., Los Angeles 64.

CALIFORNIA HEART ASSOCIATION Annual Meeting and Scientific Session. May 23 through 25. Claremont Hotel, Berkeley. *Contact:* J. Keith Thwaites, executive director, 1428 Bush Street, San Francisco 9.

FALL 1960 MEETINGS

PAN-PACIFIC SURGICAL ASSOCIATION 8th Intensive Surgical Congress, embracing all Surgical Specialties. September 28 through October 5. Honolulu, Hawaii. *Contact:* F. J. Pinkerton, M.D., director general, Suite 230, Alexander Young Building, Honolulu 13.

WESTERN INDUSTRIAL MEDICAL ASSOCIATION combined Meeting with 4th Western Industrial Health Conference. October 7 through 9. Jack Tar Hotel, San Francisco. *Contact:* Vern G. Gormley, M.D., president, 3032 Tulare Street, Fresno 21.



THE PHYSICIAN'S *Bookshelf*

METALS AND ENGINEERING IN BONE AND JOINT SURGERY—Charles Orville Bechtol, M.D., Professor of Orthopedic Surgery and Chairman of Orthopedic Division, University of California, Los Angeles; Chairman of Subcommittee on Testing, Prosthetics Research Board, National Research Council; Albert Barnett Ferguson, Jr., M.D., Silver Professor of Orthopedic Surgery, and Chairman of Orthopedic Department, University of Pittsburgh; Children's and Presbyterian Hospital, Pittsburgh; and Patrick Gowans Laing, M.B., B.S., F.R.C.S., Assistant Professor of Orthopedic Surgery, University of Pittsburgh; Chief of Orthopedic Service, U. S. Veteran's Hospital, Oakland, Pittsburgh. The Williams & Wilkins Company, Baltimore 2, Maryland, 1959. 186 pages, \$8.00.

Surgeons have long felt the need for a reliable source of information on metallic implants. Such information has been hard to get, scattered as it is among metallurgical, engineering and other books and journals. Indeed, even when at hand such articles are often difficult to understand because of the engineering and metallurgical terminology—little understood by the average physician. In this book by Bechtol, Ferguson and Laing, this language barrier has been annihilated, the whole subject being simplified and clarified in the language of the practicing surgeon. All phases are illustrated by charts, diagrams and photographs of excellent quality. It contains a wealth of information on the structure of metals, their fabrication into implants, their uses in bone and joint surgery, their care before implantation and what can be expected of them under various environmental and stress conditions after implantation.

With the development of aseptic operating room technique, open reduction of fractures and the use of internal fixation devices became practical and popular. During the early 1900's Lambotte of Brussels plated hundreds of broken bones experimenting with different types of alloys in various shapes and sizes. In his book on this subject are pictured early examples of marrow nailing. The struggle against infection waxed unabated. W. A. Lane (1895) championed a "no touch" technique and so popularized the use of bone plates that to this day many "old timers" automatically say "Lane Plate" whenever the subject is mentioned. The important work of a number of surgeons is succinctly summarized, including a reproduction from the 1913 article of Hey-Groves showing various metallic gadgets, rods, cylinders, and springs inserted in the marrow canals of fragments of experimentally produced fractures. At about the same time Sherman's quest for a "more elastic" plate led to his popularizing the vanadium steel plate which reigned practically unchallenged for some two decades. Early this century it was discovered that Chromium mixed with a Cobalt base produced a new metal with such stellar quantities, that it was called Stellite.

Shortly thereafter surgical implants of this new metal (Vitalium) appeared on the scene. Since Venable and Stuck (1937) published their experimental work on the remarkable corrosion resistance of Vitalium, Cobalt base implants have increased in popularity. During these decades the qualities of stainless steel have also been improved.

Today it can be safely said that the throne long occupied by King Vanadium has fallen to a dual occupancy by stainless steel and Vitalium.

Laymen and even some physicians tend to think of bone as an inert, unchanging substance and that a metallic implant is even more static and indestructible. Nothing could be further from the truth. Metals tend to oxidize or corrode, this process being assisted by the acid environment of a fresh fracture, the salinity of tissue juices, or the electro-chemical action of dissimilar metals of an electrolyte process set up between areas. Furthermore, it is now recognized that corrosion may occur between two pieces of similar metal or between different areas of the same plate because of varying degrees of hardness. Against this, metal has a limited capacity to resist corrosion by the spontaneous formation of a thin film of oxide on its surface. Scratching or bending a metallic implant during insertion removes this protective film and hastens the corrosive process. Metals continually shed so that the surrounding soft tissues are slowly saturated with metal which may lead to aseptic inflammation many years after implantation. For this reason metallic implants in young or middle-aged people should always be removed when they have served their purpose.

In addition to these above-described reactions to environment the "internal structure" of metallic implants changes as the result of oft-repeated bend or torsion stresses. Fracture (fatigue) of plates or screws results directly from such repeated stresses rather than age. An implant may break under the repeated occult bending stresses inherent in normal usage of a well-knitted bone. An implant will always fracture in the presence of non-union unless, of course, the screws have so loosened that stresses are no longer transmitted to the plate.

The raw surfaces of such fatigue fractures are characteristic and recognizable. These characteristics are described and there are excellent photographs illustrating them. Methods of measuring hardness of metal, its ability to resist stress and changes produced by bending are described in a way easily understood by those unfamiliar with metallurgy.

The internal structure of metals, how faults and undesirable inclusions may appear in their basic crystalline structure is described and pictured. This is followed by a short discussion of stainless steel, its manufacture, the three main types in common use and finally a description of the type (316) now used by American manufacturers of surgical implants. The essential requirements of metallic corrosion resistance, strength without brittleness, ease of workability, availability and economy are discussed. Vitalium, the popular Cobalt based alloy, is very corrosion resistant but has to be cast and is hence quite expensive. Titanium and Zirconium are corrosion resistant pure elements which may be more extensively employed in the future.

When a non-corrosion resistant, "soft metal" screw driver is used, tiny metallic fragments are transferred to the screw slot. A "slipping screw driver" will not only damage the oxide surface of the plate but will seed the plate with a

different type of metal. In the same way fragments from hammerheads, punches, etc. seed the ends of prostheses and nails. Thus corrosion currents are established.

The author thus recommends the use of double slotted screws held in a screw-holding screw driver. To further reduce metal transfer and corrosion arising from surface damage he makes many suggestions, a few of which are:

1. Avoid dumping screws and plates together in a box.
2. Keep implants of different composition carefully separated.
3. Avoid seizing screws with a hemostat (unless rubber shod).
4. Never re-use an implant.
5. Never clamp a plate to the bone with a metal clamp.

Dr. Bechtol drilled various sized holes through one cortex of dog femurs and measured the force necessary to fracture them—small holes decreased the breaking strength almost as greatly as larger holes. Conclusion: There is no advantage in making holes smaller than 20 per cent of the outside diameter of the bone. As a result of his extensive experiments, he is able to lay down certain criteria for the manufacture of a more perfect drill for use in bone surgery. These include a chisel point tip whose angle is 90° instead of the customary 56° and dull edges on the spiral flute to prevent reaming out of the hole caused by wobbling. In the application of a bone plate only a limited amount of periosteal stripping is safe—hence bone plates must be small and are necessarily less strong than normal bone. In experiments T or I beam shaped nails are 300 to 400 per cent stronger in resistance to bending force than tri-flanged nails. Parham bands of Vitalium inserted around the mid-femur of dogs, for six weeks caused no grooving from bone absorption under the bands and left the breaking strength unimpaired. He recommends use of the lag screw principle when fixing a spiral fracture, by drilling a slightly larger hole in the proximal cortex. After experimenting with many types of screws he concluded that the size and threads of standard bone screws now in use are quite satisfactory and there is no need for change in design.

DON KING, M.D.

CLINICAL DERMATOLOGY—For Students and Practitioners—Harry M. Robinson, Jr., B.C., M.D., Professor of Dermatology and Head of the Division of Dermatology, University of Maryland School of Medicine; Chief Dermatologist, University Hospital; and Raymond C. V. Robinson, B.S., M.D., M.Sc. (Med.), Associate Professor of Dermatology, University of Maryland School of Medicine; Assistant Chief of the Dermatology Clinic, University Hospital. The Williams & Wilkins Company, Baltimore 2, Maryland, 1959. 242 pages, \$8.50.

This is an attractive two hundred twenty-eight page book. The pages are larger than those of many standard texts, measuring approximately seven and one-half by ten inches. It is printed in double columns on fine paper and in legible type which makes for easy reading.

It appears to be a prime consideration of the authors to present dermatology in a brief and concise manner. The subjects discussed are carefully organized and outlined into major divisions set apart in bold type with subdivisions identified by paragraphing, italics, indentations, outlines and charts. A few drawings and numerous black and white reproductions of photographs are used effectively.

The book is divided into two main sections. The first sixty pages are entitled "General Considerations." The following subjects are presented: (1) Anatomy of the Skin; (2) Physiologic and Chemical Functions of the Skin; (3) Etiology of Dermatoses; (4) Diagnostic Procedures; (5) Dermal Histopathology; (6) Mycology; (7) Allergy; (8) Occupational Dermatoses; (9) Venereal Diseases; (10) Psychosomatic Medicine Applied to Dermatology; (11) Therapy.

Considering the scope of the material and the limited space allotted, I believe this part of the book is excellent.

The remainder of the book is headed "Morphologic Dermatology." First come fourteen pages of lists, outlines and charts. In these the common dermatoses are classified as to type of *primary lesion* (macule, papule, vesicle, pustule, et cetera), *configuration* (annular, linear, grouped, et cetera) and other *special features* (excoriations, ulcers, alopecias, et cetera). They are charted as to region or site of predilection, special morphologic features, secondary lesions, subjective symptoms, etiology, diagnostic tests, et cetera.

The remainder and bulk of the book divides the common dermatoses into the following classifications: (1) Macular Eruptions; (2) Papular Eruptions; (3) Vesicular Eruptions; (4) Pustular Eruptions; (5) Eruptions Involving the Scalp and Other Hairy Areas; (6) Lesions Involving the Mucous Membranes; (7) Sweat Gland Lesions; (8) Nail Lesions; (9) Tropical Diseases; (10) Peripheral Vascular Diseases. Each disease in each of these classifications is then outlined under the following sub-headings: (1) Synonym; (2) Sites of Predilection; (3) Objective Symptoms; (4) Subjective Symptoms; (5) Etiology; (6) Histopathology; (7) Diagnostic Aids; (8) Relation to Systemic Disease; (9) Differential Diagnosis; (10) Therapy.

Finally, there is an extensive index.

There are obvious advantages and also some disadvantages to this method of presentation. Among the latter is the fact that the features of many skin diseases are so variable as to defy arbitrary classification in any single morphologic category. This leads to both duplication of material in a few cases and oversimplification in others.

I believe the value of the book is well summarized in the "Foreword" in which it is stated, "The authors, drawing from their vast clinical experience, have prepared a text which is suited ideally as a primer in dermatologic diagnosis for the medical student primarily." It should also serve well as a supplement to lectures in dermatology for student nurses. Finally, it should be helpful for a quick review of dermatology by physicians in general practice or those specializing in other fields than dermatology."

H. V. ALLINGTON, M.D.

HANDBOOK OF DIET THERAPY—Third Edition—Written and compiled by Dorothea Turner, Department of Medicine, University of Chicago, for the American Dietetic Association. The University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois, 1959. 222 pages, \$5.00.

The third edition of the Handbook of Diet Therapy (since 1946) has expanded from 112 to 222 pages. The purpose remains the same: to provide aid in naming, defining and describing therapeutic diets in line with dietetic principles. Definitions of dietetic terminology are included in a 15-page glossary which appears as an appendix. Therapeutic diets are considered as modifications of the normal diet and as such are planned to meet or exceed the dietary requisites of the normal.

In this third edition, basic patterns of diet are outlined in terms of five commonly used food groups. These include the milk group, the vegetable and fruit group, the meat group, the bread-cereal-potato-legume group, and the fats and sweets. Since this fifth group adds little in proteins, minerals and vitamins, it is considered separately from the other four, which contain the essential food elements other than calories.

This handbook is most authoritative in its field. Written primarily for dietitians, it can be extremely valuable to doctors, medical students and others interested in diet therapy.

EDGAR WAYBURN, M.D.

AUTOGENIC TRAINING—A Psychophysiological Approach in Psychotherapy—Johannes H. Schultz, M.D., and Wolfgang Luthe, M.D. Grune & Stratton, New York, 1959. 289 pages, \$9.50.

This book is the first presentation of the psychotherapeutic method of J. H. Schultz to the English-speaking reader. Autogenic training, the technique of autosuggestion which is the subject of the book, was developed during the first quarter of this century. In 1932 Schultz first formulated the procedure and its applications in his work "Das Auto-gene Training," from which several German editions were thereafter published. The technique of autogenic training was derived from the development of hypnotic procedures and, although it has characteristics that make it a unique technique of psychotherapy, it has to be historically considered in connection with hypnosis.

It is on the basis of some experiences reported by patients in light hypnotic state that the psychotherapeutic technique considered here was originated. Schultz observed that the general relaxation preceding deep hypnosis was consistently accompanied by some somatic sensations reported by the patients. Heaviness and warmth of the extremities were among these sensations. He then thought that the systematic suggestion of some of these feelings in the patients might by itself result in somatic and vegetative relaxation that could be of psychotherapeutic value. The scientific naiveté of this rationale, whereby a mere correlational link is attributed connotations of causality, was, however, no impediment for the elaboration of an actually successful method. And the reason for this success cannot be ascertained, since the physiological mechanisms involved in the use of the method remain obscure.

It is surprising that not until the present time has the method been published in the English language, for autogenic training has been widely used for the last 25 years in many continental clinics, particularly for the treatment of psychosomatic disorders.

The method consists, essentially, of a progressive series of exercises practiced by the patient, at first under the supervision of the therapist and later by himself alone, but always under the direct or indirect guidance of the therapist, who plays a role which could be qualified as pedagogic. The aim of the exercises is the achievement of mental and bodily relaxation, and this aim is reached by following successive "physiological" steps. The steps are attained by means of hetero- or autosuggestion of local changes in the subject's muscular and visceral systems. The fundamental steps are heaviness and warmth of extremities, regularization of heart and respiration, warmth in the abdomen and coolness of the forehead. Verbal formulae, on which the patient has to concentrate mentally, help him to bring about not only the changes suggested but also the experience of them. In addition to the mentioned steps, which constitute the basis of the so-called "standard exercises," the technique makes use of other exercises to fit the particular therapeutic needs of each patient. Various "meditative" exercises, "organ-specific" exercises, and "intentional formulae" can thus be utilized as complementary procedures. Autogenic training is used in the treatment of a great variety of neurotic, functional and characterologic disorders, ranging from psychosomatic syndromes of practically any organ or system to habit disorders and drug addiction.

In contrast with hypnosis, the method calls for an active participation of the patient in the therapeutic process. The authors suggest that an advantage of the method is the fact that the procedure minimizes the dependence of the patient on the therapist. In this respect, although this dependence is less than in other types of psychotherapy, its importance in the successful application of the method cannot be belittled. Furthermore, it is the opinion of many psychiatrists, the

reviewer among them, that autogenic training is very effective when used in conjunction with other forms of therapy. This does not apply to the treatment of all cases, but it is particularly true when deep conflicts play a role in the pathogenesis of a given syndrome. The authors also note that the method helps to make unconscious material more readily available. A logical conclusion from this would be that autogenic training is valuable as an auxiliary method for psychoanalysis. And this seems to be the case in the opinion of many.

The book is clear, as is the method itself, and is rich in well described case material. In the last part of the book there is a description of a series of extremely interesting observations of autonomic changes occurring during the standard exercises of autogenic training. The last chapter, on "theory," is the weakest in the book, although it is perhaps the best that could be written under its heading. The difficulty in explaining satisfactorily the neurophysiological mechanisms involved in autogenic exercises is admitted by the authors. The neurophysiological arguments tentatively proposed are based primarily on the investigations of W. R. Hess on the hypothalamus and also those on the reticular structures of the brain stem. Although the hypotheses are well formulated, the experimental evidence supporting them is poor. It is not the first time in which a good therapy has been found for psychiatric disorders on the basis of little more than empirical evidence. And yet, this does not imply the negation of the proven value of the method.

A very good book. It should be in the library of the psychotherapist.

J. M. FUSTER, M.D.

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MEANING OF POISON, THE—Lloyd G. Stevenson, M.D., Professor of the History of Medicine, Dean of the Faculty of Medicine, McGill University. Logan Clendening Lectures on the History and Philosophy of Medicine—Seventh Series. University of Kansas Press, Lawrence, Kansas, 1959. 53 pages, \$2.00.

The title of this book of lectures is as misleading as a movie title. Actually, there are two unrelated topics discussed. To quote from the statement on the jacket: "The seventh series of the Logan Clendening Lectures on the History and Philosophy of Medicine deals with two aspects of the meaning of 'poison'—'poison as a pathogen in the very broad sense' and 'poison as a tool of research in physiology and pharmacology.' 'Poison, Infection and Contagion' traces the history of the ideas the words represent; 'Hellish Oorali' tells the story of curare."

In a rather hodge-podge but interesting way the author has traced the concept of poisoning from ancient and Biblical writings; he has shown how words with multiple meaning have been mistranslated and how words meaning anger or rage have often a second meaning of poison or venom. A modern example is the French word *rage* which means not only fury or anger, but also hydrophobia. Poison has often been associated with arrows, not only among modern aboriginal races, but also in classical mythology. Dr. Stevenson shows that our word "toxicology" is derived from the Greek word "toxon," meaning "bow" or the adjective "toxi-kon," meaning "pertaining to a bow." Much of the remainder of the first chapter is devoted to the development of the concept of infection and of the confusion of infectious agents with poisons and poisonous emanations.

The second chapter is a very sketchy history of curare, containing many bits of information not previously known to the reviewer. The discussion of poisons, especially curare, as a research tool is too general and leaves the reader wondering just how the tool is used and what is learned by use of the tool.

CLINTON H. THIENES, M.D.

PROCEEDINGS OF THE SIXTH INTERNATIONAL CONGRESS OF THE INTERNATIONAL SOCIETY OF HEMATOLOGY—Boston, August 27 to September 1, 1956. Grune & Stratton, 381 Fourth Ave., New York 16, N. Y., 1958. 930 pages, \$25.00.

This volume presents over 700 papers, many in abstract, in all fields of hematology. There are sections on leukemia, isotopes (nucleonics), the spleen and hypersplenism, hemorrhagic disorders, anemia and immunohematology. Introductory papers in several sections are of a review nature and of general interest to clinicians. The material is of most interest to the hematologist and investigator and available nowhere else.

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SURGERY IN WORLD WAR II—NEUROSURGERY, Volume I—Prepared and published under the direction of Major General S. B. Hays, The Surgeon General, United States Army; Editor in Chief Colonel John Boyd Coates, Jr., MC; Editors for Neurosurgery, R. Glen Spurling, M.D., and Barnes Woodhall, M.D.; Associate Editor, Elizabeth M. McFetridge, M.A. Office of the Surgeon General, Department of the Army, Washington, D. C., 1958. 466 pages, \$5.00.

This book is the first of two volumes relating the history of neurosurgery in World War II. The present volume is concerned with the administrative problems encountered in establishing an effective neurosurgical service within the Medical Department and also the management of head injuries. The second volume will present the problems of injuries to the spine, including peripheral nerve injuries and rupture of the intervertebral disc. The chapters and authors in the present volume are listed below:

PART I. ADMINISTRATIVE CONSIDERATIONS IN NEUROSURGERY

- I. The Zone of Interior, by Barnes Woodhall, M.D.
- II. The Mediterranean (formerly North African) Theater of Operations by Eldridge H. Campbell, Jr., M.D., (deceased).
- III. The European Theater of Operations, by R. Glen Spurling, M.D.

PART II. THE MANAGEMENT OF HEAD INJURIES

- IV. Historical note, by Barnes Woodhall, M.D.
- V. Head injuries in the Zone of Interior, by Barnes Woodhall, M.D.
- VI. The Mediterranean Theater of Operations, Eldridge H. Campbell, Jr., M.D.
- VII. The European Theater of Operations, by R. Glen Spurling, M.D.
- VIII. The management of acute craniocerebral injuries due to missiles, by Donald C. Matson, M.D.
- IX. Penetrating wounds of the cerebral ventricles, by Henry G. Schwartz, M.D.
- X. Infections following acute gunshot wounds of the brain, by Stuart N. Rowe, M.D.
- XI. Blast concussion and cerebral injuries due to explosion waves, by Fritz J. Cramer, M.D.
- XII. Cranioplasty, by David L. Reeves, M.D.
- XIII. Post-traumatic epilepsy, by A. Earl Walker, M.D.
- XIV. Speech disorders resulting from gunshot wounds of the head and neck, by William G. Peacher, M.D.
- XV. Clinicopathologic aspects of fatal missile-caused craniocerebral injuries, by Eldridge H. Campbell, Jr., M.D., Hartwig Kuhlbeck, M.D., Robert L. Cavanaugh, M.D., and Aage E. Nielsen, M.D.

The first portion of this book which is concerned with the administrative problems in neurosurgery during World War II describes the difficulties encountered in establishing neurosurgical centers both in the zone of the interior and over-

seas. Shortages in equipment and instruments as well as in trained personnel had to be overcome, and it was only through the establishment of rapid training courses in neurosurgery for already experienced general surgeons that it was possible in the early stages of the war to provide adequate professional care. The errors committed and the frustrations experienced in the development of a neurosurgical service and its administration are dealt with frankly.

The chapters concerning various aspects in the management of head injuries are all written by men who played an active role in military surgery. Much of the book was written during 1946 and 1947 which precluded the possibility of long-term follow-up in the treatment of such cases as repair of cranial defects, and cortical excision for post-traumatic epilepsy.

The book is extremely well illustrated and indexed.

This volume should be of particular interest to all neurosurgeons with military experience. It should also be of value to those neurosurgeons concerned only with civilian practice.

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HYPERTENSIVE DISEASE—Diagnosis and Treatment—Sibley W. Hoobler, M.D., Associate Professor of Internal Medicine, University of Michigan Medical School; Director of Hypertension Unit, University of Michigan Hospital. A Hoeber-Harper Book, Paul B. Hoeber, Inc., 49 East 33rd Street, New York 16, New York, 1959. 353 pages, \$7.50.

Hoobler's book is a lucid, detailed discussion of the clinical aspects of hypertension. Written by a man who has devoted most of his professional life to the study of hypertension both clinically and physiologically, the text is authoritative and up to date. It will be of considerable value to the practitioner because of its eminently practical orientation and the specific treatment regimens which complement the discussion of principles. There is a good section on secondary hypertension both curable and incurable, as well as a comprehensive coverage of primary hypertension. Details of the new drugs are amply illustrated and pertinent appendices provide specific instruction.

The book is a valuable addition to the literature on hypertension and will receive favorable acceptance by those physicians eager to have a practical guide to the clinical management of hypertensive patients written by a master in the field.

MAURICE SOKOLOW, M.D.

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PSYCHOTHERAPY AND SOCIETY—Psychotherapy for the Many and the Few—Wladimir G. Eliasberg, M.D., Ph.D., F.A.P.A. Philosophical Library, 15 East 40th Street, New York 16, N. Y., 1959. 223 pages, \$6.00.

Psychotherapy and Society is an extremely difficult book to read—at times because of its language, and at times because of its unpredictable and sudden changes in direction.

It is a book that gives promise of being a commentary on present-day psychiatry and society but loses its objective in attempting too much. It skips from esoteric philosophical concepts to the cost of psychoanalysis and from the recommendation that psychologists be permitted to use hypnosis to the frustrations and conflicts of successful people.

It touches on a wide variety of topics including advertising, propaganda, quackery, mental hygiene, group psychotherapy, psychosomatic medicine, anti-semitism, psychotherapy in Russia, motivation for work, and ethics, in a way that leaves the reader "breathless and bewildered."

The reader will tend to get lost in the vast array of topics and comments. Although it contains many ideas which are thought provoking, it will not appeal to most physicians.

NORMAN Q. BRILL, M.D.

CANCER IN CALIFORNIA—Prepared by California Tumor Registry Bureau of Chronic Diseases. Published by State of California, Department of Public Health, 1959. Complimentary copy received from Malcolm H. Merrill, M.D., Director, California State Department of Public Health and Lester Breslow, M.D., Chief, Bureau of Chronic Diseases, Division of Preventive Medical Services.

This interesting monograph summarizes many facts concerning today's cancer picture in California.

Since 1900, California's population has increased considerably, the estimate for those 65 years and over is 14 times. About 50 years ago, only 6 per cent of deaths were ascribed to cancer; currently over 16 per cent are so ascribed. Allowing for the age differential, the total death rate from cancer has increased slightly in the last 30 years. This increase has been conspicuous in males, chiefly owing to primary bronchial cancer.

Contrary to much of the hysteria in the daily press and in certain other publications, the recorded leukemia death rate, both nationally and in California, has increased only moderately. Most of this "increase" may be due to improved laboratory facilities.

The decrease in female cancer rates is apparently partly due to improved results of treatment in uterine cancer, notably improved radiotherapeutic results in cancer of the cervix.

As of 1956, the five most frequent sites of male cancers in California were: Lung, stomach, prostate, colon and pancreas. The five most frequent female sites were: Breast, colon, ovary, cervix and corpus uteri.

Interesting data on apparent associations with economic conditions, race, and occupation are appended. The officials of the California Tumor Registry under the able directorship of Dr. Lester Breslow, are to be commended for this useful compilation.

L. H. GARLAND, M.B.

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DISEASES OF THE NOSE, THROAT AND EAR—Second Edition—Edited by Chevalier Jackson, M.D., Sc.D., LL.D., L.H.D., F.A.C.S., Late Honorary Professor of Laryngology and Broncho-Esophagology, Temple University Medical Center; and Chevalier L. Jackson, M.D., M.Sc., F.A.C.S., Professor of Laryngology and Broncho-Esophagology, Temple University Medical Center; with the Collaboration of 61 Outstanding Authorities. W. B. Saunders Company, Philadelphia, 1959. 886 pages, 1193 illustrations on 645 figures including 16 plates in color, \$20.00.

Because of its general excellence, and because the extant American texts on this subject were notably archaic, the original edition of Jackson and Jackson's "Diseases of the Nose, Throat and Ear," published in 1944, was particularly well received. Edited by the late Chevalier Jackson and his distinguished son, and consisting of a large number of individual sections each written by an outstanding authority, the first edition of this text was understandably noteworthy. The publication of this second edition of Jackson and Jackson was awaited with keen anticipation.

The basic organization of the book is unchanged. Of the some 107 sections which compose the new volume, only 22 are new or completely revised. The other sections are either unrevised or contain only very minor revisions. The most conspicuous change in the book is the addition of a 79-page section on plastic surgery of the nose written by J. M. Converse. While the exposition and illustrations in this section are very good, Converse's consideration of deformities of the nasal septum is relatively inadequate and his material is not well oriented in relation to current trends in rhinologic surgery. Among the other new sections are those covering diseases of the oral cavity and salivary glands, applied hematology, sensory-neural deafness, psychogenic deafness,

acoustic trauma, aviation otolaryngology, and surgery of protruding ears. Included is a new (but already obsolete) article on stapes mobilization. The portions of the text devoted to laryngology and bronchoesophagology have been partially revised and remain the most valuable parts of this volume.

It is regrettable that the dynamic changes in otorhinolaryngology which have occurred in the fifteen years which have elapsed since the publication of the original edition of this important text are not well reflected in the second edition. This reviewer is unable to recommend the new edition with any degree of enthusiasm. It is not considered to be a suitable text for medical students. The obsolescence of the greater part of this volume and of most of its bibliographic material make it relatively undesirable as a general reference book in otorhinolaryngology. The purchase of this book might be advisable for small medical libraries which do not own the original edition and are in need of material on peroral endoscopy.

CHARLES P. LEBE, M.D.

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SURGERY OF THE FOOT—Henri L. DuVries, M.D., Clinical Instructor in Surgery, Chicago Medical School; Attending Surgeon, Columbus Hospital, Mother Cabrini Hospital, and Frank Cuneo Hospital; Chairman, Dept. of Surgery, Illinois College of Chiropractic and Foot Surgery, Chicago. Foreword by Karl A. Meyer, M.D. Introduction by Edward L. Compere, M.D. The C. V. Mosby Company, St. Louis, 1959. 494 pages, \$12.50.

This encyclopedia of foot injuries, anomalies, diseases and treatment is worth reading and owning. It is an excellent reference text. The result of twenty years' practice limited to the foot, the procedures recommended are well described and usually practical.

Orthopedists will find abundant cause for disagreement with the author. His oversimplified interpretation of muscle function, his repeated quotation of the opinions of other authorities when we want to know his own, his failure to describe the foot supporting apparatus he so frequently refers to, and even his interpretation of the effect of his own operations—all these we object to. Since he touches every other foot problem, the book would have been more complete had he given a few of his practical measures for the management of common foot dermatoses.

Since the majority of the book is devoted to nonsurgical foot problems, the title "Surgery of the Foot" is a misnomer. However, its reading is informative as well as productive of controversies.

ROBERT P. WATKINS, M.D.

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SYNOPSIS OF TREATMENT OF ANORECTAL DISEASES—Stuart T. Ross, M.D., F.A.C.S., F.I.C.S., Diplomate of the American Board of Proctology; Secretary of the American Board of Proctology; the C. V. Mosby Company, St. Louis, 1959. 240 pages, \$6.50.

This handbook of Anorectal Diseases covers the field in about as concentrated or "boiled down" manner as is possible. Discussions, statistics, major surgical techniques and bibliography are deleted and this definitely enhances the value of the book. It is concise, yet well illustrated with 79 clear illustrations.

The author is to be complimented on his ability to put so much "meat" into this small book of 240 pages. The synopsis is to be recommended not only to the general practitioner, for whom it was no doubt primarily written, but also for the general surgeon who all too often finds himself desirous of a bit of quick information. This book does just that.

CONRAD J. BAUMGARTNER, M.D.

LEUKEMIA—William Dameshek, M.D., Professor of Medicine, Tufts University School of Medicine; Senior Physician and Director, Blood Research Laboratory, New England Center Hospital, Boston; Consultant in Hematology to the Surgeon-General, U. S. Army; and Frederick Gunz, M.D., Ph.D., Hematologist, Christchurch Hospital, Christchurch, New Zealand; Late Research Fellow in Hematology, New England Center Hospital, Boston. Grune & Stratton, Inc., New York, 1958. 420 pages, \$15.75.

This book, while reflecting the extensive experience of Doctor Dameshek and his group, does not limit itself to the authors' personal feelings. The entire field of leukemia is covered, together with the related myeloproliferative disorders and multiple myeloma. The classification of leukemia is that most generally employed, but the confusing term leukosarcoma is introduced to cover the lymphoma group and the reticuloses; the latter group of localized diseases is not included in the book. It is interesting to hear that in a high proportion of cases of acute leukemia, the blood picture is of little help in differentiating the type of leukemia. Electron and other microscopic and chemical means for studying leukemic cells are reviewed. The illustrations for the most part are very good, although details of single cells are only fair. The general symptoms of leukemia, the clinical picture of each variety, diagnosis and treatment are discussed at length. There is an extensive bibliography, but the index is somewhat limited. Some historical background is presented as an introduction to various sections.

While very readable, one will find this book more valuable for reference than as a monograph for cover to cover reading. It is highly recommended for internists, hematologists, radiologists, pathologists and investigators whose work brings them in contact with the leukemia problem.

AN INTRODUCTION TO CHILD PSYCHIATRY—Stella Chess, M.D., Associate Clinical Professor of Psychiatry, New York Medical College; Associate Attending Psychiatrist, Flower-Fifth Avenue Hospitals; with a foreword by Lawrence B. Slobody, M.D., Professor of Pediatrics, New York Medical College. Grune & Stratton, 381 Fourth Avenue, New York 16, N. Y., 1959. 254 pages, \$5.25.

DYNAMIC PSYCHOPATHOLOGY IN CHILDHOOD—Edited by Lucie Jessner, M.D., Professor of Psychiatry, University of North Carolina, School of Medicine, Chapel Hill, North Carolina; Faculty and Training Analyst, Washington Psychoanalytic Institute, Washington, D. C.; and Eleanor Pavenstedt, M.D., Associate Professor and Director of Child Psychiatry, Department of Psychiatry, Boston University School of Medicine, Boston, Massachusetts; Faculty and Training Analyst, Boston Psychoanalytic Institute, Boston, Massachusetts. Grune & Stratton, 381 Fourth Avenue, New York 16, N. Y., 1959. 315 pages.

With rare exceptions, the literature in Child Psychiatry consists of diverse material, often excellent, but scattered in journals, collections of articles, and, in the last decade, a series of recorded symposia on growth and development. These two books represent further extensions of efforts to compile such current knowledge for different readers.

The book by Dr. Chess has been designed as a reference book for physicians in general. It presents a fairly clear statement of the practice of Child Psychiatry today. It also shows how child psychiatric techniques, both of diagnosis and management, can be utilized by practitioners other than psychiatrists. One senses that there is considerable emphasis on the organic aspects of childhood disturbances, but the concluding chapters stress the dynamic approaches in such psychiatry and demonstrate clearly the manner in which an analytic psychiatrist goes about the process of diagnosis and therapy.

The collection of articles edited by Jessner and Pavenstedt is designed much more for those actively working in

the field of Child Psychiatry. There is a very real attempt to survey research methods and highly sophisticated treatment methods in this book. It is an excellently organized text, bringing up to date the most active approaches in understanding the many still unclear areas of the psychopathology seen in children.

HENRY H. WORK, M.D.

INDIVIDUAL AND FAMILIAL DYNAMICS—Science and Psychoanalysis, Volume II—Edited by Jules H. Masserman, M.D., Professor of Neurology and Psychiatry, Northwestern University. Grune & Stratton, New York, 1959. 218 pages, \$6.75.

This book contains the December 1957 and May 1958 transactions of the Academy of Psychoanalysis. The meetings were divided into formal and informal discussions of two unrelated problems of psychiatry, the masochistic patient and the changing concepts of familial and social dynamics. In each section papers were presented and a discussion followed. Perhaps the most striking aspect of this book and in a way a unifying element is the emphasis on the changing concepts in psychiatry pursuant to these two important areas. In each section there is a thread of historical development running throughout.

Part I consists of papers on various aspects of masochism, a panel discussion, and finally a panel review. Numbered among the many contributors are Leon Salzman, Clara Thompson, Paul Hoch, Jules Masserman and Sandor Rado. There are excursions into such areas as masochism in religion, animal experimentation, therapeutic principles, technical difficulties, dynamics and psychogenesis, and counter transference problems encountered with the masochistic patient. There was general agreement on certain essential characteristics of the masochistic problem, i.e., masochism is a ubiquitous adaptive technique involving attempted atonement and a kind of investment for future gratification.

Part II retains the same format and is concerned with the subject of familial and social dynamics. Included among the authors are psychiatry's principal investigators in this field: Nathan Ackerman, Don Jackson, Theodore Lidz, Dorothy Terry, Lyman Wynne and Gregory Bateson. The contributors make it clear that present day psychiatry will no longer subscribe to the position that man can be adequately understood when viewed in isolation.

Martin Grotjahn traces the development of family therapy and Nathan Ackerman also applies the historical approach in tracing the changes in psychoanalytic concepts of the family. Don Jackson explains his application of some communication theory concepts in the understanding of the family. Fleck, Lidz, et al., note that incestuous and homosexual problems occur frequently in the family of schizophrenics and they attribute this to the family disorganization and role confusion. Cultural and subcultural differences in value systems are discussed by John Spiegel, and the consequent necessary modifications in psychotherapeutic approach are discussed. Alexander Gralnick fittingly closes by appealing for a more benevolent view of the families of patients and makes the plea that we do not view families merely as "the cause."

In the discussion of both subjects one is struck by the obvious progress that has been made since Freud's original contributions and it is encouraging to see this body of psychoanalysts so readily criticize, modify and change older psychoanalytic concepts after the recognition of their historical importance. This book is readable, at times entertaining and witty and is, for the most part, informative and enlightening. There is much that is applicable to the treatment situation.

ROBERT F. IVERSON, M.D.